Fifty-First Asilomar Conference on Signals, Systems and Computers

October 29–November 1, 2017
Asilomar Hotel and
Conference Grounds

Technical Co-sponsor

IEEE
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FIFTY-FIRST ASILOMAR CONFERENCE ON SIGNALS, SYSTEMS AND COMPUTERS

Technical Co-Sponsor

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Welcome from the General Chairman

Prof. Geert Leus
Delft University of Technology

Welcome to the 51st Asilomar Conference on Signals, Systems, and Computers! This is the first edition after Asilomar's golden jubilee, and I am really honored to serve as General Chair this year. Asilomar is well known in the community as a high-quality conference where world-renowned researchers present their most recent results, in some cases even just a few days old. Some of the greatest achievements in our field were presented first at Asilomar. For me personally, Asilomar has always been this place where you can combine great lectures on exciting emerging topics, with relaxing walks, runs and bike rides in the most beautiful natural environment. The first time I was at Asilomar was as a PhD student back in 1999 and ever since I try to make it to this one-of-a-kind conference.

We have a very strong technical program for you this year with a good mix of invited, regular and poster sessions. I would like to sincerely thank the Technical Program Chair Prof. Joseph R. Cavallaro and his team of Technical Area Chairs: Urbashi Mitra, Elza Erkip, Antonio G. Marques, Marco Duarte, Piya Pal, Behtash Babadi, Christoph Studer, Tokunbo Ogunfunmi, and Markku Juntti (Vice Track Chair). They all did an outstanding job in coordinating the technical aspects of this conference. This year's program consists of 432 accepted papers, of which 191 were invited. Among these papers, 88 were submitted to the student paper contest, from which a list of 12 finalists were selected. These finalists will present their papers in a poster session to a committee of judges on Sunday afternoon, and everybody is of course welcome to attend. The top three papers will be awarded at the Monday plenary session.

I am really pleased that this year's plenary speaker will be Prof. Robert W. Heath Jr. from the University of Texas at Austin. Robert is a lifelong attendee of Asilomar and has been actively involved in the organization for many years. Robert is an authority in millimetre wave communications for fifth generation (5G) wireless technology. He is one of the few researchers in this area who spans a bridge between theoretical foundations and practical implementation aspects. Furthermore, Robert is well-anchored in the field of signal processing and can enlighten us on this exciting area from a signal processing point of view, overviewing past achievements and pinpointing future challenges. I am greatly looking forward to this plenary.

Serving as General Chair for this conference was a great journey. I hope you will enjoy the conference and please take some time to experience the special environment and atmosphere that Asilomar has to offer.

Prof. Geert Leus
Delft University of Technology

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*participating in his or her personal capacity

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Technical Chairman
Prof. Joseph Cavallaro
Rice University

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2017 Asilomar Conference Session Schedule

Sunday Afternoon, October 29, 2017

3:00–7:00 PM	Registration — Merrill Hall
4:00–6:30 PM	Student Paper Contest — Heather Hall
7:00–9:00 PM	Welcoming Reception — Merrill Hall

Monday Morning, October 30, 2017

7:30–9:00 AM	Breakfast – Crocker Dining Hall
8:00 AM–6:00 PM	Registration
8:15–9:45 AM	MA1a — Conference Welcome and Plenary Session — Chapel
9:45–10:15 AM	Coffee Social — Chapel

10:15–11:55 AM MORNING SESSIONS

MA1b	Securing Crowded and Open Networks: Physical-Layer Security in 5G (Invited)
MA2b	Dirty-RF for Multi-User Massive-MIMO (Invited)
MA3b	Graph Signal Processing (Invited)
MA4b	Nonconvex Optimization (Invited)
MA5b	Theory for Next Generation Radar Systems (Invited)
MA6b	Signal Processing-Enhanced Biomedical Instrumentation
MA7b	Dynamically Scheduled High-Level Synthesis (Invited)
MA8b1	Detection, Classification, and Tracking (Poster)
MA8b2	Video and Image Processing (Poster)
MA8b3	Multimedia Processing Systems (Poster)

12:00–1:00 PM Lunch – Crocker Dining Hall

Monday Afternoon, October 30, 2017

1:30–5:10 PM AFTERNOON SESSIONS

MP1a	Network Inference (Invited)
MP1b	DNA Storage (Invited)
MP2a	Massive MIMO: Vision and Reality (Invited)
MP2b	Cloud and Fog-Assisted 5G (Invited)
MP3a	Distributed Methods for Large-scale Optimization (Invited)
MP3b	Dynamic Control in Wireless Networks (Invited)
MP4a	Low-dimensional Models for Big Data (Invited)
MP4b	High-dimensional Estimation: Theory and Algorithms (Invited)
MP5a	Mathematics of Super-Resolution (Invited)
MP5b	Waveform and Array Optimization for Multistatic/MIMO Radar (Invited)
MP6a	Identification and Control of Neural Dynamics (Invited)
MP6b	Statistical Signal Processing and Learning in Neuroscience (Invited)
MP7a	Machine Learning for Information Retrieval, Speech, and Image Processing (Invited)
MP7b	Testbed-Based 5G Research (Invited)
MP8a1	Large-Scale Data (Poster)
MP8a2	Message Passing and Matrix Factorization Algorithms (Poster)
MP8a3	Computer Arithmetic II (Poster)
MP8a4	Computer Architecture II (Poster)

Monday Evening, October 30, 2017

6:00–9:30 PM Conference Cocktail/Social — Merrill Hall
The Cocktail/Social takes the place of Monday's dinner.
No charge for conference attendees and a guest.

2017 Asilomar Conference Session Schedule
(continued)

Tuesday Morning, October 31, 2017

7:30–9:00 AM Breakfast — Crocker Dining Hall
8:00 AM–5:00 PM Registration

8:15–11:55 AM MORNING SESSIONS
TA1a Interface of Communications and Control (Invited)
TA1b Cognitive Networks (Invited)
TA2a Video Delivery Over Wireless Caching Networks: Theory and Practice (Invited)
TA2b Millimeter-Wave MIMO Wireless Systems (Invited)
TA3a Smart Networked Infrastructure (Invited)
TA3b Networks and Society (Invited)
TA4a Structured and Covariance Matrix Recovery (Invited)
TA4b Adaptive Sensing (Invited)
TA5 Tensor Methods (Invited)
TA6a Signal Processing for Neuroimaging (Invited)
TA6b Computational Ultrasound Imaging (Invited)
TA7a Computer Arithmetic (Invited)
TA7b Computer Arithmetic Algorithms
TA8a1 Statistical Signal Processing (Poster)
TA8a2 Adaptive Signal Processing II (Poster)
TA8a3 Compressed Sensing (Poster)
TA8a4 Information Theoretic and Networked Signal Processing (Poster)
TA8b1 Massive MIMO Communication Systems (Poster)
TA8b2 Issues in MIMO System Design (Poster)
TA8b3 Array Processing Algorithms for Radar (Poster)
TA8b4 Source Localization (Poster)

12:00–1:00 PM Lunch – Crocker Dining Hall

Tuesday Afternoon, October 31, 2017

1:30–5:35 PM AFTERNOON SESSIONS
TP1a Fundamentals of mmWave Communications
TP1b Hardware Designs for 5G Wireless Systems (Invited)
TP2a Noncoherent Wireless Communications (Invited)
TP2b Massive MIMO Systems
TP3a Medical Image Acquisition and Reconstruction (Invited)
TP3b Networks of the Brain (Invited)
TP4a Crowdsourcing (Invited)
TP4b Adaptive Signal Processing I
TP5a Array Processing for Spectrum Sharing (Invited)
TP5b Sparsity and Structure in Human Bio-Imaging (Invited)
TP6a Biomedical Signal Processing and Information Extraction (Invited)
TP6b Asynchronous and Neural Computing (Invited)
TP7a Computer Architecture
TP7b Optimization Methods for Image Processing (Invited)
TP8a1 Networks and Graphs (Poster)
TP8a2 Biomedical Signal Processing (Poster)
TP8a3 Networks and Applications (Poster)
TP8a4 Networks for Communication Systems (Poster)
TP8b1 Privacy, Secrecy and Channel Capacity (Poster)
TP8b2 Communication System Design and Resource Allocation (Poster)
TP8b3 Coding Theory and Sequences (Poster)
TP8b4 Detection Methods and mmWave Systems (Poster)

Tuesday Evening Open Evening — Enjoy the Monterey Peninsula

2017 Asilomar Conference Session Schedule
(continued)

Wednesday Morning, November 1, 2017

7:30–9:00 AM	Breakfast — Crocker Dining Hall
8:00 AM–12:00 PM	Registration — Copyright forms must be turned in before the registration closes at 12:00 noon.

8:15 AM–11:30 PM MORNING SESSIONS

WA1a	Theory of Wireless Systems
WA1b	Theory of Structured Waveforms
WA2a	MIMO Channel Estimation
WA2b	Speech Processing
WA3a	Wireless Networks
WA3b	Signal Processing over Graphs and Networks
WA4a	Computational Imaging (Invited)
WA4b	Deep Learning and Applications
WA5a	Information Limits and Signals Representations (Invited)
WA5b	Array Signal Processing Algorithms
WA6a	Signal Processing for Hearing Aids (Invited)
WA6b	Neural Signal Processing
WA7a	Hardware Design for Machine Learning (Invited)
WA7b	Video Processing

12:00–1:00 PM Lunch — This meal is not included in the registration.

Student Paper Contest

Heather Hall – Sunday, October 29, 2017, 4:00–6:30 PM

A: Communications Systems
"Lossless Natural Sampling for PWM Generation"
Noyan Sevuktekin, Andrew Singer, University of Illinois at Urbana-Champaign, United States

"5G Millimeter Wave Cellular System Capacity with Fully Digital Beamforming"
Sourjya Dutta, C. Nicolas Barati, Aditya Dhananjay, Sundeep Rangan, New York University, Tandon School of Engineering, United States

B: MIMO Communications and Signal Processing
"The Impact of Impedance Matching on Channel Estimation in Compact MIMO Receivers"
Wuyuan Li, Brian Hughes, North Carolina State University, United States

C: Networks
"Beyond Consensus and Synchrony in Decentralized Online Optimization using Saddle Point Method"
Amrit Singh Bedi, Indian Institute of Technology Kanpur, India; Alec Koppel, University of Pennsylvania, United States; Ketan Rajawat, Indian Institute of Technology Kanpur, India

"Online Learning for "Thing-Adaptive" Fog Computing in IoT"
Tianyi Chen, Yanning Shen, University of Minnesota, United States; Qing Ling, University of Science and Technology of China, China; Georgios B. Giannakis, University of Minnesota, United States

D: Signal Processing and Adaptive Systems
"Recovery Conditions and Sampling Strategies for Network Lasso"
Alexandru Mara, Alexander Jung, Aalto University, Finland

"Target-Based Hyperspectral Demixing via Generalized Robust PCA"
Sirisha Rambhatla, Xingguo Li, Jarvis Haupt, University of Minnesota-Twin Cities, United States

E: Array Signal Processing
"Adaptive Sequential Refinement: A Tractable Approach for Ambiguity Function Shaping in Cognitive Radar"
Omar Aldayel, Tiantong Guo, Vishal Monga, Pennsylvania State University, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States

"Multiple-Antenna Multiple-Access Joint Radar and Communications Systems Performance Bounds"
Yu Rong, Alex Chririyath, Daniel Bliss, Arizona State University, United States

F: Biomedical Signal and Image Processing
"On Developing an FPGA Based System for Real Time Seizure Prediction"
Sarah Hooper, Erik Biegert, Marissa Levy, Justin Pensock, Luke Van der Spoel, Xiaoran Zhang, Tianyi Zhang, Rice University, United States; Nitin Tandon, University of Texas Health Science Center, United States; Behnaam Aazhang, Rice University, United States

G: Architecture and Implementation
"Performance Comparison of AES-GCM-SIV and AES-GCM Algorithms for Authenticated Encryption on FPGA Platforms"
Sandhya Koteshwara, University of Minnesota, United States; Amitabh Das, Intel Corporation, United States; Keshab K. Parhi, University of Minnesota, United States

H: Speech, Image and Video Processing
"Multi-Object Detection and Tracking via Kernel Covariance Factorization in Thermal Video"
Guohua Ren, Ioannis Schizas, University of Texas at Arlington, United States

2017 Asilomar Conference Session Schedule

Coffee breaks will be at 9:55 AM and 3:10 PM. (except Monday morning when refreshments will be served outside the Chapel from 9:45–10:15 AM)

Monday, October 30, 2017

CONFERENCE WELCOME AND PLENARY SESSION 8:15–9:45 AM — CHAPEL

1. Welcome from the General Chair

Prof. Geert Leus
Delft University of Technology, The Netherlands

2. Session MA1a Distinguished Lecture for the 2017 Asilomar Conference

Millimeter Wave MIMO Signal Processing

Prof. Robert Heath
University of Texas at Austin, USA

Abstract
Millimeter wave has become an incubator for the rebirth of MIMO communication. It has many applications, as a core 5G technology, and also as a conduit for emerging applications of wireless to fixed access, vehicular, aerial, and wearable networks. In this talk, I explain why communication at millimeter wave — and even higher frequencies — is interesting from a signal processing perspective. I first describe the three differentiating features of communication at millimeter wave: larger arrays, new channel models, and power constraints. Then I explain how these features impact the formulation and solution of traditional MIMO signal processing problems like beamforming, precoding, and channel estimation. I describe the signal processing challenges associated with fast antenna array configuration. In particular, I highlight how out-of-band information, sensing, and machine learning algorithms can reduce the overhead in tasks such as adaptive channel estimation and beamforming. I conclude with directions for future research.

Biography

Robert W. Heath Jr. received the Ph.D. in EE from Stanford University. He is a Cullen Trust for Higher Education Endowed Professor in the Department of Electrical and Computer Engineering at The University of Texas at Austin and a Member of the Wireless Networking and Communications Group. He is also the President and CEO of MIMO Wireless Inc and Chief Innovation Officer at Kuma Signals LLC. Prof. Heath is a recipient of the 2012 Signal Processing Magazine Best Paper award, a 2013 Signal Processing Society best paper award, the 2014 EURASIP Journal on Advances in Signal Processing best paper award, and the 2014 Journal of Communications and Networks best paper award, the 2016 IEEE Communications Society Fred W. Ellersick Prize, and the 2016 IEEE Communications Society and Information Theory Society Joint Paper Award. He authored “Introduction to Wireless Digital Communication” (Prentice Hall in 2017), co-authored “Millimeter Wave Wireless Communications” (Prentice Hall in 2014), and authored “Digital Wireless Communication: Physical Layer Exploration Lab Using the NI USRP” (National Technology and Science Press in 2012). He is a licensed Amateur Radio Operator, a registered Professional Engineer in Texas, and is a Fellow of the IEEE.

Program of the
2017 Asilomar Conference on
Signals, Systems, and Computers

Technical Program Chairman
Prof. Joseph Cavallaro
Rice University

Session MA1b Securing Crowded and Open Networks: Physical-Layer Security in 5G (Invited)

Chair: *Matthieu Bloch, Georgia Tech*

MA1b-1 Physical Layer Security in Massive MIMO Systems 10:15 AM
Rafael F. Schaefer, Technische Universität Berlin, Germany; Gayan Amarasuriya, Southern Illinois University, United States; H. Vincent Poor, Princeton University, United States

MA1b-2 Implementing a Real-Time Capable WPLS Testbed for Independent Performance and Security Analyses 10:40 AM
Christian Zenger, Mario Pietersz, Andreas Rex, Jeremy Brauer, Falk-Peter Dressler, Christian Baiker, Daniel Theis, Christof Paar, Ruhr Universität Bochum, Germany

MA1b-3 Learning and Secrecy in 5G Networks 11:05 AM
Matthieu Bloch, Georgia Institute of Technology, United States; Aylin Yener, The Penn State University, United States

MA1b-4 A Complete Stealthy Communication System 11:30 AM
Pin-Hsun Lin, Carsten R. Janda, TU Dresden, Germany; Rafael F. Schaefer, Technische Universität Berlin, Germany; Eduard A. Jorswieck, TU Dresden, Germany

Session MA2b Dirty-RF for Multi-User Massive-MIMO (Invited)

Chair: *Inbar Fijalkow, ENSEA*

MA2b-1 On Out-of-Band Emissions of Quantized Precoding in Massive MU-MIMO-OFDM 10:15 AM
Sven Jacobsson, Giuseppe Durisi, Chalmers University of Technology, Sweden; Mikael Coldrey, Ericsson, Sweden; Christoph Studer, Cornell University, United States

MA2b-2 Per-Antenna Hardware Optimization and Mixed Resolution ADCs in Uplink Massive MIMO 10:40 AM
Daniel Verenzuela, Emil Björnson, Linköping University, Sweden; Michail Matthaiou, Queen's University Belfast, United Kingdom

MA2b-3 Predistortion Techniques for Vector Perturbation Precoding of One-Bit Massive-MIMO 11:05 AM
Inbar Fijalkow, ETIS, Université Paris Seine, Université de Cergy-Pontoise, ENSEA, CNRS, France; A. Lee Swindlehurst, University of California, Irvine, United States

MA2b-4 Directional Timing Synchronization in Wideband Millimeter Wave Cellular Systems with Low-Resolution ADCs 11:30 AM
Dalin Zhu, Robert Heath, University of Texas at Austin, United States

Session MA3b Graph Signal Processing (Invited)

Co-Chairs: *Pierre Borgnat, Centre National de la Recherche Scientifique and Nicolas Tremblay, GIPSA-lab Grenoble Images Parole Signal Automatique*

MA3b-1 Analyzing the Approximation Error of the Fast Graph Fourier Transform 10:15 AM
Luc Le Magoarou, b<>com, France; Nicolas Tremblay, CNRS, France; Rémi Gribonval, INRIA Rennes Bretagne-Atlantique, France

MA3b-2 Tropical Graph Signal Processing 10:40 AM
Vincent Gripon, IMT Atlantique, France

MA3b-3 Tree-structured filter banks for M-block cyclic graphs 11:05 AM
Aamir Anis, University of Southern California, United States; David B.H. Tay, LaTrobe University, Australia; Antonio Ortega, University of Southern California, United States

MA3b-4 Predicting the Evolution of Stationary Graph Signals 11:30 AM
Andreas Loukas, École Polytechnique Fédérale de Lausanne, Switzerland; Elvin Isufi, TU Delft, Netherlands; Nathanael Perraudin, École Polytechnique Fédérale de Lausanne, Switzerland

Session MA4b Nonconvex Optimization (Invited)

Chair: *Gongguo Tang, Colorado School of Mines*

MA4b-1 When and Why are Nonconvex Optimization Problems Not Scary? 10:15 AM
Ju Sun, Stanford University, United States; Qing Qu, John Wright, Columbia University, United States

MA4b-2 Matrix Completion, Saddlepoints, and Gradient Descent 10:40 AM
Jason Lee, University of Southern California, United States

MA4b-3 Regularized Gradient Descent: A Nonconvex Recipe for Fast Joint Blind Deconvolution and Demixing 11:05 AM
Shuyang Ling, Thomas Strohmer, University of California, Davis, United States

MA4b-4 A Provable Method for Sparse CPD/PARAFAC Tensor Decomposition 11:30 AM
Sirisha Rambhatla, Di Xiao, Jarvis Haupt, Nicholas D. Sidiropoulos, University of Minnesota-Twin Cities, United States

Session MA5b Theory for Next Generation Radar Systems (Invited)

Chair: *Waheed Bajwa, Rutgers University*

MA5b-1 Joint Radar-Communications Waveform Multiple Access and Synthetic Aperture Radar Receiver — 10:15 AM
Andrew Herschfelt, Daniel Bliss, Arizona State University, United States

MA5b-2 Demonstrating Significant Passive Radar Performance Increase Through using Known Communication Signal Format — 10:40 AM
Yonggang Wu, Qian He, Jianbin Hu, University of Electronic Science and Technology of China, China; Rick Blum, Lehigh University, United States

MA5b-3 Weighted Sparse Bayesian Learning (WSBL) with Application to MIMO Radar Using Sparse Sensing — 11:05 AM
Ahmed Al Hilli, Rutgers University, USA and Al furat Al Awsat Technical Collage, Iraq; Athina Petropulu, Rutgers, The State University of New Jersey, United States

MA5b-4 Through-The-Wall Radar Imaging using a Distributed Quasi-Newton Method — 11:30 AM
Haroon Raja, Waheed U. Bajwa, Rutgers University, United States; Fauzia Ahmad, Temple University, United States

Session MA6b Signal Processing-Enhanced Biomedical Instrumentation

Chair: *Behtash Babadi, University of Maryland*

MA6b-1 A Real-Time Rodent Neural Interface for Deciphering Acute Pain Signals from Neuronal Ensemble Spike Activity — 10:15 AM
Sile Hu, Zhejiang University, China; Qiaosheng Zhang, Jing Wang, Zhe Chen, New York University School of Medicine, United States

MA6b-2 Real-Time, Data-Driven Algorithm and System to Learn Parameters for Pacemaker Beat Detection — 10:40 AM
Yamin Arefeen, Philip Taffet, Daniel Zdeblick, Jorge Quintero, Greg Harper, Behnaam Aazhang, Joseph Cavallaro, Rice University, United States; Mehdi Razavi, Texas Heart Institute, United States

MA6b-3 On Developing an FPGA Based System for Real Time Seizure Prediction — 11:05 AM
Sarah Hooper, Erik Biegert, Marissa Levy, Justin Pensock, Luke Van der Spoel, Xiaoran Zhang, Tianyi Zhang, Rice University, United States; Nitin Tandon, University of Texas Health Science Center, United States; Behnaam Aazhang, Rice University, United States

MA6b-4 Use of Adaptive Filtering for Improved Performance in Digital Stethoscopes — 11:30 AM
Donald Hall, Mathew Mctaggart, William Jenkins, Pennsylvania State University, United States

Session MA7b Dynamically Scheduled High-Level Synthesis (Invited)

Co-Chairs: *Paolo Ienne, EPFL, Switzerland and Philip Brisk, University of California, Riverside*

MA7b-1 A Hierarchical Mathematical Model for Automatic Pipelining and Allocation using Elastic Systems — 10:15 AM
Jordi Cortadella, Jordi Petit, Universitat Politècnica de Catalunya, Spain

MA7b-2 From C to Elastic Circuits — 10:40 AM
Lana Josipovic, École Polytechnique Fédérale de Lausanne, Switzerland; Philip Brisk, University of California, Riverside, Switzerland; Paolo Ienne, École Polytechnique Fédérale de Lausanne, Switzerland

MA7b-3 Run Fast When You Can: Loop Pipelining with Uncertain and Non-uniform Memory Dependencies — 11:05 AM
Junyi Liu, John Wickerson, Imperial College London, United Kingdom; Samuel Bayliss, Xilinx, United States; George Constantinides, Imperial College London, United States

MA7b-4 Adaptive Loop Pipelining in High-Level Synthesis — 11:30 AM
Zhiru Zhang, Steve Dai, Gai Liu, Ritchie Zhao, Cornell University, United States

Session MA8b1 Detection, Classification, and Tracking

Chair: *Marco Duarte, University of Massachusetts Amherst*

10:15 AM–11:55 AM

MA8b1-1 Scheduling Variable Field-of-View Sensors for Tracking Multiple Objects
Joao Cabrera, BAE Systems, United States

MA8b1-2 Automatic Modulation Classification Via Symbolic Representations of Complex Time Series Data
Eric Ruzomberka, Purdue University, United States; Gary H. Whipple, Laboratory for Telecommunication Sciences, United States; Catherine M. Keller, Bruce MacLeod, MIT Lincoln Laboratory, United States

MA8b1-3 Resolving Occlusion Ambiguity by Combining Kalman Tracking with Feature Tracking for Image Sequences
Mark Heimbach, Kamak Ebadi, Sally Wood, Santa Clara University, United States

MA8b1-4 Detector design using Item Response Theory with applications to Active Insider Threat Detection
Jayakrishnan Unnikrishnan, Zhihui Yang, Satish Iyengar, General Electric Global Research, United States; Susan Embretson, Georgia Institute of Technology, United States

MA8b1-5 Efficient and Robust Classification of Seismic Data using Nonlinear Support Vector Machines
Kyle Hickmann, Jeffrey Hyman, Gowri Srinivasan, Los Alamos National Laboratory, United States

MA8b1-6 Feature Based Order Recognition of Continuous-Phase FSK using Principal Component Analysis
Ambaw Ambaw, Miloš Doroslovacki, George Washington University, United States

MA8b1-7 Nonstationary Linear Discriminant Analysis
Shuilian Xie, Mahdi Imani, Edward Dougherty, Ulisses Braga-Neto, Texas A&M University, United States

MA8b1-8 Bayesian Kalman Filtering in the Presence of Unknown Noise Statistics Using Factor Graphs
Roozbeh Dehghannasiri, Texas A&M University, United States; Mohammad Shahrokh Esfahani, Stanford School of Medicine, United States; Xiaoning Qian, Edward Dougherty, Texas A&M University, United States

Session MA8b2 Video and Image Processing

Chair: *Sally Wood, Santa Clara University*

10:15 AM–11:55 AM

MA8b2-1 Adaptive Search Pattern for Fast Motion Estimation in Video
Pavel Arnaudov, Tokunbo Ogunfunmi, Santa Clara University, United States

MA8b2-2 Monocular Vehicle Distance Sensor Using HOG and Kalman Tracking
Marcos Gonzalez, Jerry Hsu, Robert Christiansen, Sally Wood, Santa Clara University, United States

MA8b2-3 Human Activity Classification from Wearable Devices with Cameras
Yantao Lu, Senem Velipasalar, Syracuse University, United States

MA8b2-4 Bayer Feature Map Approximation through Spatial Pyramid Convolution
Allen Rush, Sally Wood, Santa Clara University, United States

MA8b2-5 Photometric Warp-based SFSR with Application to Infrared Image Processing
James Glenn-Anderson, Supercomputer Systems, Inc., United States

MA8b2-6 Fast and Compact Kronecker-structured Dictionary Learning for Image Classification
Ishan Jindal, Matthew Nokleby, Wayne State University, United States

MA8b2-7 Automatic Fog Detection in Day and Night Images to Improve Highway Driving Conditions
Victor DeBrunner, Jigar Patel, Florida State University, United States

MA8b2-8 Superpixels Based Marker Tracking Vs. Hue Thresholding In Rodent Biomechanics Application
Omid Haji Maghsoudi, Annie Vahedipour Tabrizi, Benjamin Robetrson, Andrew Spence, Temple University, United States

Session MA8b3 Multimedia Processing Systems

Chair: *Tokunbo Ogunfunmi, Santa Clara University*

10:15 AM–11:55 AM

MA8b3-1 3D Mesh Robust Watermarking Technique for Ownership Protection
Farhan Alenizi, Prince Sattam bin Abdulaziz University, Saudi Arabia; Fadi Kurdahi, Ahmed Eltaweel, University of California, Irvine, United States

MA8b3-2 Fast Stochastic Hierarchical Bayesian MAP for Tomographic Imaging
John McKay, Pennsylvania State University, United States; Raghu Raj, Naval Research Laboratory, United States; Vishal Monga, Pennsylvania State University, United States

MA8b3-3 Nonlinear Image Interpolation via Deep Neural Network
Wentian Zhou, Xin Li, Daryl Reynolds, West Virginia University, United States

MA8b3-4 On the Effects of Windowing on the Discretization of the Fractional Fourier Transform
Balu Santhanam, University of New Mexico, United States; Thalanayar Santhanam, Saint Louis University, United States; Satish Mandal, University of New Mexico, United States

MA8b3-6 Effect of Random Vertical Orientation for Mobile Users in Visible Light Communications
Yusuf Said Eroglu, Yavuz Yapici, Ismail Guvenc, North Carolina State University, United States

MA8b3-7 A Best-Features based Digital Rotoscope
Iain Murphy, Tyler Norlund, Vivek K. Pallipuram, University of the Pacific, United States

MA8b3-8 Automatic Blind Source Separation of Speech Sources in an Auditory Scene
Kenneth Faller II, Jason Riddley, Elijah Grubbs, California State University, Fullerton, United States

Session MP1a Network Inference (Invited)

Chair: *Negar Kiyavash, University of Illinois, Urbana-Champaign*

MP1a-1 Seeded Graph Matching: Efficient Algorithms and Theoretical Guarantees 1:30 PM
Farhard Shirani, NYU Tandon School of Engineneering, United States; Siddharth Garg, New York University, United States; Elza Erkip, NYU Tandon School of Engineneering, United States

MP1a-2 Towards Provably Invisible Network Flow Fingerprints 1:55 PM
Ramin Soltani, Dennis Goeckel, Don Towsley, Amir Houmansadr, University of Massachusetts Amherst, United States

MP1a-3 Efficient Neighborhood Selection for Walk Summable Gaussian Graphical Models 2:20 PM
Yingxang Yang, Jalal Etesami, Negar Kiyavash, UIUC, United States

MP1a-4 Assembling a Graph from Many Small Unlabeled Subgraphs 2:45 PM
Matthias Grossglauser, Lyudmila Yartseva, École Polytechnique Fédérale de Lausanne, Switzerland

Session MP1b DNA Storage (Invited)

Chair: *Lara Dolecek, University of California, Los Angeles*

MP1b-1 Storing Information in Short DNA Molecules 3:30 PM
Ilan Shomorony, Reinhard Heckel, Kannan Ramchandran, University of California, Berkeley, United States; David Tse, Stanford University, United States

MP1b-2 Coding Techniques for Emerging DNA-Based Storage Systems 3:55 PM
Ryan Gabrys, Olgica Milenkovic, University of Illinois at Urbana-Champaign, United States

MP1b-3 Faster Reconstruction Through Coding for DNA Storage 4:20 PM
Frederic Sala, Clayton Schoeny, Lara Dolecek, University of California, Los Angeles, United States

MP1b-4 Multidimensional DNA-Based Data Storage 4:45 PM
Hossein Tabatabaei Yazdi, Ryan Gabrys, Olgica Milenkovic, UIUC, United States

Session MP2a Massive MIMO: Vision and Reality (Invited)

Chair: *Thomas Marzetta, Nokia Bell Labs*

MP2a-1 Scaling Up Distributed Massive MIMO: Why and How 1:30 PM
Sofie Pollin, KU Leuven, Belgium

MP2a-2 mmWave Massive MIMO with Simple RF and Advanced DSP 1:55 PM
Amine Mezghani, A. Lee Swindlehurst, University of California, Irvine, United States

MP2a-3 Analysis of Nonlinear Low-Noise Amplifiers in Massive MIMO Base Stations 2:20 PM
Christopher Mollén, Linköpings Universitet, Sweden; Ulf Gustavsson, Ericsson, Sweden; Thomas Eriksson, Chalmers, Sweden; Erik G. Larsson, Linköpings Universitet, Sweden

MP2a-4 Future Cell - An End to End Massive MIMO Fronthauling System 2:45 PM
Andreas Pascht, Nokia Bell Labs, Germany

Session MP2b Cloud and Fog-Assisted 5G (Invited)

Co-Chairs: *Osvaldo Simeone, Newark College of Engineering and Ravi Tandon, University of Arizona*

MP2b-1 Dynamic Wireless Computing Network Control 3:30 PM
Hao Feng, University of Southern California, United States; Jaime Llorca, Nokia Bell Labs, United States; Antonia Tulino, Bell Labs & Università di Napoli Federico II, United States; Andreas Molisch, University of Southern California, United States

MP2b-2 Topological Edge Caching with no CSI at the Edge 3:55 PM
Wei-Ting Chang, Ravi Tandon, University of Arizona, United States; Osvaldo Simeone, King's College, United Kingdom

MP2b-3 Multicast for Cloud Radio-Access Networks with Heterogeneous Backhaul 4:20 PM
Ya-Feng Liu, Chinese Academy of Sciences, China; Wei Yu, University of Toronto, Canada

MP2b-4 Coding for Edge-Facilitated Wireless Distributed Computing with Heterogeneous Users 4:45 PM
Mehrdad Kiamari, University of Southern California, United States; Chenwei Wang, DOCOMO Labs, United States; Salman Avestimehr, University of Southern California, United States

Session MP3a Distributed Methods for Large-scale Optimization (Invited)

Co-Chairs: *Alejandro Ribeiro, University of Pennsylvania and Aryan Mokhtari, University of Pennsylvania*

MP3a-1 Optimal Algorithms for Smooth and Strongly Convex Distributed Optimization in Networks 1:30 PM
Kevin Scaman, MSR-INRIA Joint Center, France; Francis Bach, INRIA, Ecole Normale Supérieure, France; Sébastien Bubeck, Yin Tat Lee, Microsoft Research, United States; Laurent Massoulié, MSR-INRIA Joint Center, France

MP3a-2 Beyond Consensus and Synchrony in Decentralized Online Optimization using Saddle Point Method 1:55 PM
Amrit Singh Bedi, Indian Institute of Technology Kanpur, India; Alec Koppel, University of Pennsylvania, United States; Ketan Rajawat, Indian Institute of Technology Kanpur, India

MP3a-3 A Doubly Quasi-Newton Method for Decentralized Consensus Optimization 2:20 PM
Mark Eisen, Aryan Mokhtari, Alejandro Ribeiro, University of Pennsylvania, United States

MP3a-4 Coded Shuffling for Distributed Machine Learning: Theory and Practice 2:45 PM
Jichan Chung, Kangwook Lee, Korea Advanced Institute of Science & Technology (KAIST), Republic of Korea; Ramtin Pedarsani, University of California, Santa Barbara, United States; Dimitris Papailiopoulos, University of Wisconsin-Madison, United States; Kannan Ramchandran, University of California, Berkeley, United States

Session MP3b Dynamic Control in Wireless Networks (Invited)

Chair: *Nicolò Michelusi, Purdue University*

MP3b-1 Contextual Combinatorial Bandits in Wireless Distributed Computing 3:30 PM
Pranav Sakulkar, Bhaskar Krishnamachari, University of Southern California, United States

MP3b-2 Learning-Guided Network Resource Allocation: A Closed-Loop Approach 3:55 PM
Xueying Guo, Huasen Wu, Xiaoxiao Wang, Xin Liu, University of California, Davis, United States

MP3b-3 Active Spectrum Sensing with Sequential Sub-Nyquist Sampling 4:20 PM
Lorenzo Ferrari, Anna Scaglione, Arizona State University, United States

MP3b-4 Topology-Agnostic Average Consensus in Sensor Networks with Limited Data Rate 4:45 PM
Chang-Shen Lee, Nicolo Michelusi, Gesualdo Scutari, Purdue University, United States

Session MP4a Low-dimensional Models for Big Data (Invited)

Chair: *Chinmay Hegde, Iowa State University*

MP4a-1 Memory-Limited Subspace Tracking with Poisson Data 1:30 PM
Liming Wang, Yuejie Chi, The Ohio State University, United States

MP4a-2 Sharp Asymptotics for Blind Estimation with Geometric Constraints 1:55 PM
Yue Lu, Harvard University, United States

MP4a-3 Efficient Signal Detection on Graphs 2:20 PM
Venkatesh Saligrama, Boston University, United States

MP4a-4 The Convex and Nonconvex Geometries of Tensor Factorization 2:45 PM
Qiuwei Li, Gongguo Tang, Colorado School of Mines, United States

Session MP4b High-dimensional Estimation: Theory and Algorithms (Invited)

Chair: *Yue Lu, Harvard University*

MP4b-1 Discrete Submodular Optimization via Continuous Nonconvex Optimization 3:30 PM
Mahdi Soltanolkotabi, University of Southern California, United States

MP4b-2 Some Sharp Asymptotics for Spectral Initialization Methods for Nonconvex Optimization 3:55 PM
Yue Lu, Harvard University, United States

MP4b-3 Nonconvex Sparse Blind Deconvolution: Global Geometry and Efficient Methods 4:20 PM
Yuqian Zhang, Han-Wen Kuo, John Wright, Columbia University, United States

MP4b-4 Implicit Regularization in Nonconvex Statistical Optimization 4:45 PM
Yuxin Chen, Princeton University, United States

Session MP5a Mathematics of Super-Resolution (Invited)

Chair: *Gongguo Tang, Colorado School of Mines*

MP5a-1 Information and Resolution 1:30 PM
Albert Fannjiang, University of California, Davis, United States

MP5a-2 A Sampling Theorem for Robust Deconvolution 1:55 PM
Brett Bernstein, Courant Institute, New York University, United States; Carlos Fernandez-Granda, Courant Institute and Center for Data Science, NYU, United States

MP5a-3 Sampling Patterns for Off-The-Grid Spectral Estimation 2:20 PM
Maxime Ferreira Da Costa, Wei Dai, Imperial College London, United Kingdom

MP5a-4 A Super-resolution Algorithm for Multiband Signal Identification 2:45 PM
Zhihui Zhu, Dehui Yang, Michael Wakin, Gongguo Tang, Colorado School of Mines, United States

Session MP5b Waveform and Array Optimization for Multistatic/MIMO Radar (Invited)

Co-Chairs: *Maria S. Greco, University of Pisa and Shannon Blunt, University of Kansas*

MP5b-1 Antenna and Pulse Selection for Colocated MIMO Radar 3:30 PM
Ehsan Tohidi, Hamid Behroozi, Sharif University, Iran; Geert Leus, Delft University of Technology, Netherlands

MP5b-2 Joint Design for Co-existence of MIMO Radar and MIMO Communication System 3:55 PM
Junhui Qian, University of Electronic Science and Technology of China, China; Marco lops, University of Cassino and Southern Latium, Italy; Le Zheng, Xiaodong Wang, Columbia University, United States

MP5b-3 Adaptive Sequential Refinement: A Tractable Approach for Ambiguity Function Shaping in Cognitive Radar 4:20 PM
Omar Aldayel, Tiantong Guo, Vishal Monga, Pennsylvania State University, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States

MP5b-4 MIMO Radar Beampattern Optimization with Ripple Control Using Sum-of-squares Representation 4:45 PM
Tuomas Aittomaki, Visa Koivunen, Aalto University, Finland

Session MP6a Identification and Control of Neural Dynamics (Invited)

Chair: *ShiNung Ching, Washington University in St. Louis*

MP6a-1 Latent Variable Models for Uncovering Motor Cortical Ensemble Dynamics 1:30 PM
Zhe Chen, New York University School of Medicine, United States; Jose Iriarte-Diaz, University of Illinois at Chicago, United States; Nicholas Hatsopoulos, Callum Ross, Kazutaka Takhashi, University of Chicago, United States

MP6a-2 Neural System Identification for Optimizing Stimulation-Enhanced, Sleep- Mediated, Memory Consolidation 1:55 PM
Kyle Lepage, Allen Institute for Brain Science, United States; Sujith Vijayan, Boston University, United States

MP6a-3 Spike Sorting Requirements for Sensory Neurocontrol 2:20 PM
Jason Ritt, Samuel Brown, Boston University, United States

MP6a-4 Identifying Disruptions in Brain Network Control Properties Due to Focal Injury 2:45 PM
Sina Khanmohammadi, Terrance Kummer, ShiNung Ching, Washington University in St. Louis, United States

Session MP6b Statistical Signal Processing and Learning in Neuroscience (Invited)

Chair: *Dmitri Chklovskii, Simons Foundation*

MP6b-1 Fully Automated Spike Sorting of Large-Scale Multi-Day Neural Recordings 3:30 PM
Jeremy Magland, Flatiron Institute, United States; Jason Chung, University of California, San Francisco, United States; Alex Barnett, Dartmouth College, United States; Loren Frank, University of California, San Francisco, United States; Leslie Greengard, Flatiron Institute, United States

MP6b-2 Distance Covariance Analysis 3:55 PM
Benjamin Cowley, Joao Semedo, Carnegie Mellon University, United States; Douglas Ruff, University of PIttsburgh, United States; Amin Zandvakili, Brown University, United States; Marlene Cohen, Matthew Smith, University of Pittsburgh, United States; Adam Kohn, Albert Einstein College of Medicine, United States; Byron Yu, Carnegie Mellon University, United States

MP6b-3 Deconstructing Odorant Identity via Primacy in Dual Networks 4:20 PM
Daniel Kepple, Hamza Giaffar, Cold Spring Harbor Laboratory, United States; Dmitry Rinberg, New York University, United States; Alexei Koulakov, Cold Spring Harbor Laboratory, United States

MP6b-4 Biological Learning Through Min-Max Dynamics of Synaptic Plasticity 4:45 PM
Cengiz Pehlevan, Flatiron Institute, United States

Session MP7a Machine Learning for Information Retrieval, Speech, and Image Processing (Invited)

Chair: *Tokunbo Ogunfunmi, Santa Clara University*

MP7a-1 Using Information Theoretic Learning Techniques to Train Neural Networks 1:30 PM
Manas Deb, Tokunbo Ogunfunmi, Santa Clara University, United States

MP7a-2 What to Play Next? A RNN-Based Music Recommendation System 1:55 PM
Miao Jiang, Ziyi Yang, Indiana University, United States; Chen Zhao, University of Tsukuba, Japan

MP7a-3 Transfer Learning with Variational Auto-Encoders 2:20 PM
Suthee Chaidaroon, Yi Fang, Santa Clara University, United States

MP7a-4 Preference Elicitation in Recommender Systems using Matrix Factorization with Non-Personalized and Personalized Steps 2:45 PM
Kirk Iserman, Yuhong Liu, Santa Clara University, United States

Session MP7b Testbed-Based 5G Research (Invited)

Chair: *Ove Edfors, Lund University, Sweden*

MP7b-1 Building and Operating a Real-Time Massive MIMO Testbed - Lessons Learned 3:30 PM
Steffen Malkowsky, Liang Liu, Viktor Öwall, Ove Edfors, Lund University, Sweden

MP7b-2 ArgosNet: A Multi-Cell Many-Antenna MU-MIMO Platform 3:55 PM
Clayton Shepard, Rahman Doost-Mohammady, Jian Ding, Ryan Guerra, Lin Zhong, Rice University, United States

MP7b-3 SBXG - A City-Scale Software-Defined Wireless Network 4:20 PM
J. Nicholas Laneman, University of Notre Dame, United States

MP7b-4 From massive MIMO to C-RAN: the OpenAirInterface 5G testbed 4:45 PM
Florian Kaltenberger, Xiwen Jiang, Raymond Knopp, Eurecom, France

MP7b-5 Scalable 5G MPSoC Architecture 5:10 PM
Gerhard P. Fettweis, Emil Matus, TU Dresden, Germany

Session MP8a1 Large-Scale Data

Chair: *Maya Kabkab, University of Maryland*

1:30 PM–3:10 PM

MP8a1-1 The Case for Spatial Pooling in Deep Convolutional Sparse Coding
Maya Kabkab, University of Maryland, College Park, United States

MP8a1-2 Grid-less Estimation of Saturated Signals
Filip Elvander, Johan Swärd, Andreas Jakobsson, Lund University, Sweden

MP8a1-3 Learning Graph Evolutions from Cut Sketches: Faster Algorithms with Fewer Samples
Chinmay Hegde, Iowa State University, United States

MP8a1-4 Transform-Based Compression for Quadratic Similarity Queries
Hanwei Wu, Markus Flierl, KTH Royal Institute of Technology, Sweden

MP8a1-5 Geometric Description and Characterization of Time Series Signals
Lauren Crider, Douglas Cochran, Arizona State University, United States

MP8a1-6 Bayesian Top Scoring Pairs for Feature Selection
Emre Arslan, Ulisses Braga-Neto, Texas A&M University, United States

MP8a1-7 Random and Localized Random Projections for Radar: Statistical and Performance Analysis
Pawan Setlur, Tariq Qureshi, AFRL / WSRI, United States; Muralidhar Rangaswamy, Air Force Research Laboratory, United States

MP8a1-8 Cache-Aided Private Information Retrieval
Minchul Kim, Heecheol Yang, Jungwoo Lee, Seoul National University, Republic of Korea

Session MP8a2 Message Passing and Matrix Factorization Algorithms

Chair: *Dror Baron, North Carolina State University*

1:30 PM–3:10 PM

MP8a2-1 Recovery Conditions and Sampling Strategies for Network Lasso
Alexandru Mara, Alexander Jung, Aalto University, Finland

MP8a2-2 Sketched Clustering via Hybrid Approximate Message Passing
Evan Byrne, Philip Schniter, The Ohio State University, United States; Remi Gribonval, INRIA, France

MP8a2-3 Robust Matrix Factorization for Collaborative Filtering in Recommender Systems
Christos Bampis, University of Texas at Austin, United States; Cristian Rusu, University of Edinburgh, United Kingdom; Hazem Hajj, American University of Beirut, Lebanon; Alan Bovik, University of Texas at Austin, United States

MP8a2-4 Target-Based Hyperspectral Demixing via Generalized Robust PCA
Sirisha Rambhatla, Xingguo Li, Jarvis Haupt, University of Minnesota-Twin Cities, United States

MP8a2-5 Iterative Re-weighted L1-Norm Principal-Component Analysis
Ying Liu, State University of New York at Buffalo, United States; Dimitris A. Pados, Stella Batalama, Florida Atlantic University, United States; Michael Medley, AFRL / RITE, United States

MP8a2-6 Conditional Approximate Message Passing with Side Information
Dror Baron, North Carolina State University, United States; Anna Ma, Claremont Graduate University, United States; Deanna Needell, Claremont McKenna College, United States; Cynthia Rush, Columbia University, United States; Tina Woolf, Claremont Graduate University, United States

MP8a2-7 Analysis of a GAMP Based Algorithm with Hierarchical Priors for Recovering Non-Negative Sparse Signals
Maher Al-Shoukairi, Bhaskar Rao, University of California, San Diego, United States

MP8a2-8 Radix-4 Modular Pipeline Fast Fourier Transform Algorithm
Alekhya Lakkadi, Linda S. DeBrunner, Florida State University, United States

Session MP8a3 Computer Arithmetic II

Chair: *Linda DeBrunner, Florida State University*

1:30 PM–3:10 PM

MP8a3-1 Hyper-Threaded Multiplier for HECC
Gabriel Gallin, Arnaud Tisserand, CNRS, France

MP8a3-2 An Efficient Software Implementation of Correctly Rounded Operations Extending FMA: a + b + c and a * b + c * d
Christoph Lauter, Sorbonne Universités, France

MP8a3-3 Rigorous Determination of Recursive Filter Fixed-Point Implementation with Input Signal Frequency Specifications
Anastasia Volkova, Christoph Lauter, Thibault Hilaire, Marc Mezzarobba, Sorbonne Universités, Université Pierre et Marie Curie, France

MP8a3-4 Truncated Multiply-and-Accumulate Units for FIR Filter Implementation with Reduced Coefficient Length
Linda DeBrunner, Florida State University, United States

MP8a3-5 High-Performance Relative Position Rounding
Peter-Michael Seidel, University of Hawai'i at Manoa, United States

MP8a3-6 Digital Predistortion with Low Precision ADCs
Chance Tarver, Joseph Cavallaro, Rice University, United States

MP8a3-7 Computation Limited Matrix Inversion Using Neumann Series Expansion for Massive MIMO
Erik Bertilsson, Oscar Gustafsson, Johannes Klasson, Erik G. Larsson, Linkoping University, Sweden

Session MP8a4 Computer Architecture II

Chair: *Keshab K. Parhi, University of Minnesota*

1:30 PM–3:10 PM

MP8a4-1 A Comparison of Efficient First Stage Decimation Filters for Delta Sigma Modulators
Christopher Felton, Barry Gilbert, Clifton Haider, Mayo Clinic, United States

MP8a4-2 Molecular Computation of Complex Markov Chains with Self-Loop State Transitions
Sayed Ahmad Salehi, Utah Valley University, United States; Marc Riedel, Keshab K. Parhi, University of Minnesota, United States

MP8a4-3 A Dataflow Compiler for Code-Generation, Mapping and Partitioning in Many-Core Processor Arrays
Vivek Sabbineni, Gustav Cedersjö, Jörn Janneck, LTH, Sweden

MP8a4-4 Functional Encryption of Integrated Circuits by Key-Based Dynamical Obfuscation
Sandhya Koteshwara, Chris H. Kim, Keshab K. Parhi, University of Minnesota, United States

MP8a4-5 MIMO Detector Implementation Comparison Using High-level Synthesis Tools from Different Generations
Tuomo Hänninen, Muhammad Saad Saud, Ganesh Venkatraman, Markku Juntti, University of Oulu, Finland

MP8a4-6 Execution Trace Graph Based Interface Synthesis of Signal Processing Dataflow Programs for Heterogeneous MPSoCs
Endri Bezati, Simone Casale Brunet, SIB Vital-IT, Switzerland; Marco Mattavelli, École Polytechnique Fédérale de Lausanne, Switzerland

MP8a4-7 Wideband Spectrum Sensing Measurement Results using Tunable Front-End and FPGA Implementation
Xusong Wang, Shailesh Chaudhari, Mihir Laghate, Danijela Cabric, University of California, Los Angeles, United States

MP8a4-8 Profiling of Dynamic Dataflow Programs on MPSoC Multi-Core Architectures
Simone Casale Brunet, Endri Bezati, Swiss Institute of Bioinformatics, Switzerland; Aurelien Bloch, Marco Mattavelli, École Polytechnique Fédérale de Lausanne, Switzerland

Session TA1a Interface of Communications and Control (Invited)

Chair: *Victoria Kostina, California Institute of Technology*

TA1a-1 The Value of Information in Event Triggering: Can We Beat the Data-Rate Theorem? 8:15 AM
Khojasteh Mohammad Javad, University of California, San Diego, United States; Pavankumar Tallapragada, Indian Institute of Science, India; Jorge Cortes, Massimo Franceschetti, University of California, San Diego, United States

TA1a-2 Exploring Unpredictability in Control 8:40 AM
Gireeja Ranade, Microsoft Research, United States

TA1a-3 Finite-Horizon Rationally Inattentive Markov Decision Processes 9:05 AM
Ehsan Shafieepoorfard, Maxim Raginsky, University of Illinois at Urbana-Champaign, United States

TA1a-4 Rate-Cost Tradeoffs over Lossy Channels 9:30 AM
Anatoly Khina, Victoria Kostina, Babak Hassibi, California Institute of Technology, United States; Ashish Khisti, University of Toronto, Canada

Session TA1b Cognitive Networks (Invited)

Chair: *Marco Levorato, University of California, Irvine*

TA1b-1 Deep Neural Network Architectures for Modulation Classification 10:15 AM
Xiaoyu Liu, Diyu Yang, Aly El Gamal, Purdue University, United States

TA1b-2 Non-parametric Learning to Infer Wireless Relays, Routes and Traffic Patterns from Time Series of Spectrum Activity 10:40 AM
Silvija Kokalj-Filipovic, Vencore Labs, Inc., United States; Predrag Spasojevic, Winlab, Rutgers University, United States; Alex Poylisher, Vencore Labs, Inc., United States

TA1b-3 Intelligent Data Filtering in Constrained IoT Systems 11:05 AM
Igor Burago, Davide Callegaro, Marco Levorato, Sameer Singh, University of California, Irvine, United States

TA1b-4 Modulation Classification using Convolutional Neural Networks and Spatial Transformer Networks 11:30 AM
Danijela Cabric, Moein Mirmohammadsadeghi, University of California, Los Angeles, United States

Session TA2a Video Delivery Over Wireless Caching Networks: Theory and Practice (Invited)

Co-Chairs: *Antonia Tulino, Nokia Bell Labs and Jaime Llorca, Nokia Bell Labs*

TA2a-1 Coded Caching Main Technical Barriers: Finite Packetization and Channel Heterogeneity 8:15 AM
Karthikeyan Shanmugam, IBM Research, T. J. Watson Research Center, United States; Alexandros G. Dimakis, University of Texas at Austin, United States; Jaime Llorca, Bell Labs, United States; Antonia Tulino, Bell Labs & Università di Napoli Federico II, United States

TA2a-2 Algorithms for Asynchronous Coded Caching 8:40 AM
Hooshang Ghasemi, Aditya Ramamoorthy, Iowa State University, United States

TA2a-3 Combination Networks with Caches: Improved Achievable Scheme based on Interference Alignment 9:05 AM
Kai Wan, Laboratoire des Signaux et Systèmes, France; Mingyue Ji, University of Utah, United States; Pablo Piantanida, Laboratoire des Signaux et Systèmes, France; Daniela Tuninetti, University of Illinois at Chicago, United States

TA2a-4 Improved Caching Gains in Fast-Fading Downlinks 9:30 AM
Shirin Saeedi Bidokhti, Stanford University, United States; Michele Wigger, Telecom ParisTech, United States; Aylin Yener, Pennsylvania State University, United States

Session TA2b Millimeter-Wave MIMO Wireless Systems (Invited)

Chair: *Akbar Sayeed, University of Wisconsin-Madison*

TA2b-1 Multi-Aperture Phased Arrays Versus Multi-beam Lens Arrays for mmW Multiuser MIMO 10:15 AM
Akbar Sayeed, University of Wisconsin, United States

TA2b-2 Millimeter Wave Communications: from Point-to-Point Links to Agile Network Connections 10:40 AM
Haitham Hassanieh, University of Illinois at Urbana-Champaign, United States; Omid Abari, Dina Katabi, Massachusetts Institute of Technology, United States

TA2b-3 A Split TCP Proxy Architecture for 5G mmWave Cellular Systems 11:05 AM
Michele Polese, University of Padova, Italy; Menglei Zhang, Marco Mezzavilla, New York University, United States; Jing Zhu, Intel, United States; Sundeep Rangan, Shivendra Panwar, New York University, United States; Michele Zorzi, University of Padova, Italy

TA2b-4 Non-Orthogonal Multiple Access for mmWave Drones with Multi-Antenna Transmission 11:30 AM
Nadisanka Rupasinghe, Yavuz Yapici, Ismail Guvenc, North Carolina State University, United States; Yuichi Kakishima, Docomo Innovations, Inc., United States

Session TA3a Smart Networked Infrastructure (Invited)

Chair: *Hao Zhu, University of Illinois Urbana-Champaign*

TA3a-1 Wholesale Electricity Pricing in the Presence of Geographical Load Balancing 8:15 AM
Mohammed A. Abdelghany, Mahnoosh Alizadeh, University of California, Santa Barbara, United States; Hamed Mohsenian-Rad, University of California, Riverside, United States

TA3a-2 Distribution System Voltage Control under Uncertainties 8:40 AM
Pan Li, Baosen Zhang, University of Washington, United States

TA3a-3 A Prediction-Correction Method for Dynamic Distribution State Estimation 9:05 AM
Emiliano Dall'Anese, National Renewable Energy Laboratory, United States; Andrea Simonetto, IBM Research Ireland, Ireland; Hao Zhu, University of Illinois at Urbana-Champaign, United States

TA3a-4 Online Learning for "Thing-Adaptive" Fog Computing in IoT 9:30 AM
Tianyi Chen, Yanning Shen, University of Minnesota, United States; Qing Ling, University of Science and Technology of China, China; Georgios B. Giannakis, University of Minnesota, United States

Session TA3b Networks and Society (Invited)

Chair: *Santiago Segarra, Massachusetts Institute of Technology*

TA3b-1 Estimation of Vertex Degrees in a Sampled Network 10:15 AM
Apratim Ganguly, Natera Inc., United States; Eric Kolaczyk, Boston University, United States

TA3b-2 Joint Inference of Networks from Stationary Graph Signals 10:40 AM
Santiago Segarra, Yuhao Wang, Caroline Uhler, Massachusetts Institute of Technology, United States; Antonio Marques, King Juan Carlos University, Spain

TA3b-3 Soft Unveiling of Communities via Egonet Tensors 11:05 AM
Fatemeh Sheikholeslami, Georgios B. Giannakis, University of Minnesota, United States

TA3b-4 Aggregate Learning in Networked Dynamic Games with Strategic Agents 11:30 AM
Amir Ajorlou, Ali Jadbabaie, Massachusetts Institute of Technology, United States

Session TA4a Structured and Covariance Matrix Recovery (Invited)

Co-Chairs: *Greg Ongie, University of Michigan and Laura Balzano, University of Michigan*

TA4a-1 Learning the Second-Moment Matrix of a Smooth Function From Point Samples 8:15 AM
Armin Eftekhari, Alan Turing Institute, United Kingdom; Michael Wakin, Colorado School of Mines, United States; Ping Li, Rutgers University, United States; Paul Constantine, Colorado School of Mines, United States; Rachel Ward, University of Texas at Austin, United States

TA4a-2 Sketched Covariance Testing: A Compression-Statistics Tradeoff 8:40 AM
Gautam Dasarathy, Rice University, United States; Parikshit Shah, Yahoo Research, United States; Richard Baraniuk, Rice University, United States

TA4a-3 Performance Limits of Covariance-Driven Super Resolution Imaging 9:05 AM
Heng Qiao, Piya Pal, University of California, San Diego, United States

TA4a-4 Super-Resolution with Quantization Compressive Sensing 9:30 AM
Haoyu Fu, Yuejie Chi, The Ohio State University, United States

Session TA4b Adaptive Sensing (Invited)

Co-Chairs: *Mark Davenport, Georgia Institute of Technology and Marco Duarte, University of Massachusetts Amherst*

TA4b-1 Enhanced Online Robust PCA via Adaptive Sensing 10:15 AM
Greg Ongie, Laura Balzano, University of Michigan, United States

TA4b-2 Active Learning of Linear Separators under Asymmetric Noise 10:40 AM
Pranjal Awasthi, Rutgers University, United States; Maria-Florina Balcan, Nika Haghtalab, Hongyang Zhang, Carnegie Mellon University, United States

TA4b-3 Global Testing Against Sparse Alternatives under Ising Models 11:05 AM
Rajarshi Mukherjee, Stanford University, United States; Sumit Mukherjee, Columbia University, United States; Ming Yuan, University of Wisconsin-Madison, United States

TA4b-4 A framework for Multi-A(rmed)/B(andit) testing with online FDR control 11:30 AM
Fanny Yang, University of California, Berkeley, United States

Session TA5 Tensor Methods (Invited)

Chair: *Lieven De Lathauwer, KU Leuven*

TA5-1 Kullback-Leibler Principal Component for Tensors is not NP-hard 8:15 AM
Kejun Huang, Nicholas D. Sidiropoulos, University of Minnesota, United States

TA5-2 Directed Network Topology Inference via Sparse Joint Diagonalization 8:40 AM
Yanning Shen, Xiao Fu, Georgios B. Giannakis, Nicholas D. Sidiropoulos, University of Minnesota, United States

TA5-3 Joint Extended Factor Analysis 9:05 AM
Ahmad Mouri Sardarabadi, Groningen University, Netherlands; Alle-Jan van der Veen, TU Delft, Netherlands

TA5-4 Analytical Performance Analysis of the Semi-Algebraic Framework for Approximate CP Decompositions via Simultaneous Matrix Diagonalizations (SECSI) 9:30 AM
Sher Ali Cheema, Emilo Rafael Balda, Technical University Ilmenau, Germany; Amir Weiss, Arie Yeredor, Tel-Aviv University Israel, Israel; Martin Haardt, Technical University Ilmenau, Germany

BREAK 9:55 AM

TA5-5 Balancing Interpretability and Predictive Accuracy for Unsupervised Tensor Mining 10:15 AM
Ishmam Zabir, Evangelos Papalexakis, University of California, Riverside, United States

TA5-6 Coupled Matrix-Tensor Factorizations - The Case of Partially Shared Factors 10:40 AM
Lieven De Lathauwer, KU Leuven, Belgium; Eleftherios Kofidis, University of Piraeus, Greece

TA5-7 Tensor Decomposition for Crowdsourced Clustering 11:05 AM
Ramya Korlakai Vinayak, Babak Hassibi, California Institute of Technology, United States

TA5-8 Linear Systems with a CPD Constrained Solution 11:30 AM
Martijn Boussé, Nico Vervliet, Otto Debals, Ignat Domanov, Lieven De Lathauwer, KU Leuven, Belgium

Session TA6a Signal Processing for Neuroimaging (Invited)

Chair: *Laleh Najafizadeh, Rutgers University*

TA6a-1 Integrative Signal Processing Approaches for Neuroimaging Problems 8:15 AM
Wei Wu, Stanford University, United States; Zhe Chen, New York University, United States

TA6a-2 Multiscale Modeling of High-Dimensional Neural Activity 8:40 AM
Hamidreza Abbaspourazad, Han-Lin Hsieh, Maryam Shanechi, University of Southern California, United States

TA6a-3 Latent Variable Models for Hippocampal Sequence Analysis 9:05 AM
Etienne Ackermann, Rice University, United States; Kourosh Maboudi, Kamran Diba, University of Wisconsin-Milwaukee, United States; Caleb Kemere, Rice University, United States

TA6a-4 On Robust Detection of Brain Stimuli with Ramanujan Periodicity Transforms 9:30 AM
Pouria Saidi, George Atia, Azadeh Vosoughi, University of Central Florida, United States

Session TA6b Computational Ultrasound Imaging (Invited)

Chair: *Pieter Kruizinga, Erasmus University Medical Center*

TA6b-1 Image Reconstruction from Coded Excitation Transmit Schemes Using a Linear Model Approach 10:15 AM
John Flynn, Lauren Pflugrath, Sinan Li, Ron Daigle, Verasonics, Inc., United States

TA6b-2 Inverse Problem Approaches for Coded High Frame Rate Ultrasound Imaging 10:40 AM
Denis Bujoreanu, Barbara Nicolas, Denis Friboulet, Hervé Liebgott, University of Lyon, CREATIS, France

TA6b-3 Physics and Data Driven Models for Ultrasound Image Reconstruction 11:05 AM
Brett Byram, Kazuyuki Dei, Adam Luchies, Vanderbilt University, United States

TA6b-4 Spatial Compression in Ultrasound Imaging 11:30 AM
Pim van der Meulen, Delft University of Technology, Netherlands; Pieter Kruizinga, Johannes G. Bosch, Erasmus MC, Netherlands; Geert Leus, Delft University of Technology, Netherlands

Session TA7a Computer Arithmetic (Invited)

Chair: *Milos Ercegovac, University of California, Los Angeles*

TA7a-1 On the Relative Error of Computing Complex Square Roots in Floating-Point Arithmetic 8:15 AM
Claude-Pierre Jeannerod, INRIA, laboratoire LIP, Universite de Lyon, France; Jean-Michel Muller, CNRS, laboratoire LIP, Universite de Lyon, France

TA7a-2 Optimized Leading Zero Anticipators for Faster Fused Multiply-Adds 8:40 AM
David Lutz, ARM, United States

TA7a-3 The Future of Computing - Arithmetic Circuits Implemented with Memristors 9:05 AM
Lauren Guckert, Nagaraja Revanna, Earl Swartzlander, University of Texas at Austin, United States

TA7a-4 On Left-to-Right Arithmetic 9:30 AM
Milos Ercegovac, University of California, Los Angeles, United States

Session TA7b Computer Arithmetic Algorithms

Co-Chairs: *Earl Swartzlander, University of Texas at Austin and Milos Ercegovac, University of California, Los Angeles*

TA7b-1 Complex Block Floating-Point Format with Box Encoding For Wordlength Reduction in Communication Systems 10:15 AM
Yeong Foong Choo, Brian L. Evans, University of Texas at Austin, United States; Alan Gatherer, Huawei Technologies, United States

TA7b-2 Parallel GF(2n) Multipliers 10:40 AM
Trenton Grale, Earl Swartzlander, University of Texas at Austin, United States

TA7b-3 Twiddle Factor Complexity Analysis of Radix-2 FFT Algorithms for Pipelined Architectures 11:05 AM
Fahad Qureshi, Jarmo Takala, Tampere University of Technology, Finland

TA7b-4 A Combined IEEE Half-Precision and Single-Precision Floating Point Multipliers for Deep Learning 11:30 AM
Tuan Nguyen, James Stine, Oklahoma State University, United States

Session TA8a1 Statistical Signal Processing

Chair: *Jitendra Tugnait, Auburn University*

8:15 AM–9:55 AM

TA8a1-1 Spectrum-Based Comparison of Multivariate Complex Random Signals of Unequal Lengths
Jitendra Tugnait, Auburn University, United States

TA8a1-2 SNR Threshold Region Prediction via Singular Value Decomposition of the Barankin Bound Kernel
John Kota, Systems & Technology Research, United States; Antonia Papandreou-Suppappola, Arizona State University, United States

TA8a1-3 Period Estimation with Linear Complexity of Sparse Time Varying Point Processes
Hans-Peter Bernhard, Bernhard Etzlinger, Andreas Springer, Johannes Kepler University Linz, Austria

TA8a1-4 Estimation of Real Valued Impulse Responses based on Noisy Magnitude and Phase Measurements
Oliver Lang, Mario Huemer, Johannes Kepler University, Austria; Victor Elvira, IMT Lille Douai, France

TA8a1-5 On the Theoretical Analysis of Box-Constrained Adaptive Filters
Vitor Nascimento, Leilson Araujo, University of Sao Paulo, Brazil; Yuriy Zakharov, University of York, United Kingdom

TA8a1-6 Distribution Results for a Multi-Rank Version of the Reed-Yu Detector
Pooria Pakrooh, Louis Scharf, Colorado State University, United States

TA8a1-7 Statistical Two-Dimensional Edge Linear Prediction With Fast Algorithm
Lawrence Marple, Signal Research, United States

TA8a1-8 An Objective-Based Experimental Design Framework for Signal Processing in the Context of Canonical Expansions
Roozbeh Dehghannasiri, Xiaoning Qian, Edward Dougherty, Texas A&M University, United States

Session TA8a2 Adaptive Signal Processing II

Co-Chairs: *Thomas Paul, Orbital ATK Inc. and Azzedine Zerguine, King Fahd University of Petroleum and Minerals, Saudi Arabia*

8:15 AM–9:55 AM

TA8a2-1 On the use of Spectro-Temporal Modulation in Assisting Adaptive Feedback Cancellation for Hearing Aid Applications
Meng Guo, Oticon A/S, Denmark; Bernhard Kuenzle, Bernafon AG, Switzerland

TA8a2-2 Nonlinear Least-Mean-Square Type Algorithm for Second-Order Interference Cancellation in LTE-A RF Transceivers
Andreas Gebhard, Christian Motz, Johannes Kepler University, Austria; Ram Sunil Kanumalli, Harald Pretl, Danube Mobile Communications Engineering GmbH & Co KG, Austria; Mario Huemer, Johannes Kepler University, Austria

TA8a2-3 Adaptive Echo Cancellation Using Deep Cerebellar Model Articulation Controller
Lan Shih-Wei, Yuan Ze University, Taiwan; Yu Tsao, Academia Sinica, Taiwan; Junghsi Lee, Yuan Ze University, Taiwan

TA8a2-4 Adaptive Algorithm Based on a New Hyperbolic Sine Cost Function
Ahmad Khalifi, Qadri Mayyala, Naveed Iqbal, Azzedine Zerguine, King Fahd University of Petroleum & Minerals, Saudi Arabia; Karim Abed-Meraim, University of Orléans, PRISME Lab, France

TA8a2-5 Adaptive Digital Filtering using the Bio-Inspired Firefly Algorithm (FFA)
William Jenkins, Magni Hussain, Pennsylvania State University, United States

TA8a2-6 Optimal Blind-Adaptive Compensator for Time-Varying Frequency Selective IQ Imbalance
Durga Laxmi Narayana Swamy Inti, A. A. (Louis) Beex, Virginia Tech, United States

TA8a2-7 On Quaternion Kernel Adaptive Filtering of Nonwhite, Noncircular, and Non-Gaussian Inputs
Tokunbo Ogunfunmi, Santa Clara University, United States; Thomas Paul, Orbital ATK Inc., United States

TA8a2-8 Learning Robust General Radio Signal Detection using Computer Vision Methods
Timothy O'Shea, Tamoghna Roy, T. Charles Clancy, Virginia Tech, United States

Session TA8a3 Compressed Sensing

Chair: *Johan Swärd, Lund University, Sweden*

8:15 AM–9:55 AM

TA8a3-1 Efficient Online Dictionary Adaptation and Image Reconstruction for Dynamic MRI
Saiprasad Ravishankar, Brian E. Moore, Raj Rao Nadakuditi, Jeffrey A. Fessler, University of Michigan, United States

TA8a3-2 Modified Orthogonal Matching Pursuit for Multiple Measurement Vector with Joint Sparsity in Super-Resolution Compressed Sensing
Xuan Vinh Nguyen, Klaus Hartmann, Wolfgang Weihs, Otmar Loffeld, University of Siegen, Germany

TA8a3-3 Sparse Recovery With Quantized Multiple Measurement Vectors
Yacong Ding, Sung-En Chiu, Bhaskar D. Rao, University of California, San Diego, United States

TA8a3-4 Designing Optimal Sampling Schemes for Multi-Dimensional Data
Johan Swärd, Filip Elvander, Andreas Jakobsson, Lund University, Sweden

TA8a3-5 Hyperparameter-Selection for Sparse Regression: A Probablistic Approach
Ted Kronvall, Andreas Jakobsson, Lund University, Sweden

TA8a3-6 Sparse Bayesian Learning using Variational Bayes Inference Based on a Greedy-Based Criterion
Mohammad Shekaramiz, Todd Moon, Jacob Gunther, Utah State University, United States

TA8a3-7 Reconstruction from Periodic Nonlinearities, With Applications to HDR Imaging
Viraj Shah, Mohammadreza Soltani, Chinmay Hegde, Iowa State University, United States

TA8a3-8 Non-tensor Wavelet Sparse Basis for Random Hirschman Sensing Matrices
Peng Xi, Victor DeBrunner, Florida State University, United States

Session TA8a4 Information Theoretic and Networked Signal Processing

Chair: *Visar Berisha, Arizona State University*

8:15 AM–9:55 AM

TA8a4-1 Improved Finite-Sample Estimate of a Nonparametric f-Divergence
Prad Kadambi, Alan Wisler, Visar Berisha, Arizona State University, United States

TA8a4-2 Target Tracking via Recursive Bayesian State Estimation in Radar Networks
Yijian Xiang, Washington University in St. Louis, United States; Murat Akcakaya, University of Pittsburgh, United States; Satyabrata Sen, Oak Ridge National Laboratory, United States; Arye Nehorai, Washington University in St. Louis, United States

TA8a4-3 Exploration and Data Refinement via Multiple Mobile Sensors Based on Gaussian Processes
Mohammad Shekaramiz, Todd Moon, Jacob Gunther, Utah State University, United States

TA8a4-4 Robust Estimation of the Magnitude Squared Coherence based on Kernel Signal Processing
Ferran de Cabrera Estanyol, Jaume Riba Sagarra, Gregori Vázquez Grau, Technical University of Catalonia, Spain

TA8a4-5 Multilevel Group Testing via Sparse-Graph Codes
Pedro Abdalla, Amirhossein Reisizadeh, Ramtin Pedarsani, University of California, Santa Barbara, United States

TA8a4-6 Multipulse Subspace Detectors
Pooria Pakrooh, Louis Scharf, Colorado State University, United States

TA8a4-7 Image-Sourced Fingerprinting for LED-Based Indoor Tracking
Zafer Vatansever, Maite Brandt-Pearce, University of Virginia, United States

TA8a4-8 Penalty-Based Multitask Distributed Adaptation over Networks with Constraints
Fei Hua, Roula Nassif, Cédric Richard, Université Nice Sophia Antipolis, France; Haiyan Wang, Jianguo Huang, Northwestern Polytechnical University, China

Session TA8b1 Massive MIMO Communication Systems

Chair: *Oscar Gustafsson, Linköping University, Sweden*

10:15 AM–11:55 AM

TA8b1-2 A Joint Combiner and Bit Allocation Design for Massive MIMO Using Genetic Algorithm
Fnu I. Zakir Ahmed, Hamid Sadjadpour, University of California, Santa Cruz, United States; Shahram Yousefi, Queen's University, Canada

TA8b1-3 Sectoring in Multi-cell Massive MIMO Systems
Shahram Shahsavari, Parisa Hassanzadeh, New York University, United States; Alexei Ashikhmin, Nokia Bell Labs, United States; Elza Erkip, NYU Tandon School of Engineneering, United States

TA8b1-4 On Channel Estimation for One-Bit Massive MIMO Systems with Fixed and Time-Varying Thresholds
Pu Wang, Mitsubishi Electric Research Laboratories, United States; Jian Li, University of Florida, United States; Milutin Pajovic, Petros Boufounos, Philip Orlik, Mitsubishi Electric Research Laboratories, United States

TA8b1-5 A Study on Channel Block Sparsity in Massive MIMO Systems based on Channel Measurements
Elisabeth De Carvalho, Anders Kastersen, Alex Oliveras Martinez, Jesper Ødum Nielsen, Patrick Eggers, Aalborg University, Denmark

TA8b1-6 Proof-of-Concept of Sparse Massive MIMO Beamforming at 3.5 GHz
Thomas Wirth, Fraunhofer Heinrich Hertz Institute, Germany

TA8b1-7 Pilot Decontamination Under Imperfect Power Control
Jitendra Tugnait, Auburn University, United States

TA8b1-8 Large-Scale Antenna-Assisted Grant-Free Non-Orthogonal Multiple Access via Compressed Sensing
Hanyu Wang, Yanlun Wu, Jun Fang, University of Electronic Science and Technology, China

Session TA8b2 Issues in MIMO System Design

Chair: *Sofie Pollin, KU Leuven, Belgium*

10:15 AM–11:55 AM

TA8b2-1 Delay-Aware Routing and Data Transmission for Multi-Hop D2D Communications Under Stochastic Interference Constraints
Sireesha Madabhushi, Chandra Murthy, Indian Institute of Science, India

TA8b2-2 Layered Graph-Merged Detection and Decoding of Non-Binary LDPC Coded Massive MIMO Systems
Shusen Jing, Junmei Yang, Huayi Zhou, Southeast University, China; Yeong-Luh Ueng, National Tsing Hua University, Taiwan; Xiaohu You, Chuan Zhang, Southeast University, China

TA8b2-3 A Greedy Approach for mmWave Hybrid Precoding with Subarray Architectures
Marcin Iwanow, Nikola Vucic, Samer Bazzi, Jian Luo, Huawei Technologies Duesseldorf GmbH, Germany; Wolfgang Utschick, Technical University of Munich, Germany

TA8b2-4 Criterion of Adaptively Scaled Belief for PDA in Overloaded MIMO Channels
Takumi Takahashi, Shinsuke Ibi, Seiichi Sampei, Osaka University, Japan

TA8b2-5 Scheduling and Power Optimization in Full-Duplex Small Cells with Successive Interference Cancellation
Shahram Shahsavari, David Ramirez, New York University, United States; Elza Erkip, NYU Tandon School of Engineneering, United States

TA8b2-6 On Beam Design for Sparse Arrays of Subarrays using Multi-Objective Optimization and Estimation-Theoretic Criteria
Anant Gupta, Upamanyu Madhow, University of California, Santa Barbara, United States; Amin Arbabian, Stanford University, United States

TA8b2-7 Single Carrier Frequency Domain Compressed Training Adaptive Equalization
Baki Berkay Yilmaz, Georgia Institute of Technology, United States; Alper T. Erdogan, Koc University, Turkey

TA8b2-8 Impact of Interference Correlation on the Decoding Error Statistics
Fernando Rosas, Imperial College London, United Kingdom; Konstantinos Manolakis, Huawei Technologies, Germany; Christian Oberli, Pontificia Universidad Catolica de Chile, Chile; Marian Verhelst, Sofie Pollin, Mahdi Azari, KU Leuven, Belgium

Session TA8b3 Array Processing Algorithms for Radar

Chair: *Yimin Zhang, Temple University*

10:15 AM–11:55 AM

TA8b3-1 Time and Frequency Corrections in a Distributed Network using Gnu Public Radio
Sam Whiting, Dana Sorensen, Todd Moon, Jacob Gunther, Utah State University, United States

TA8b3-2 Joint Radar-Communications System Implementation Using Software Defined Radios: Feasibility and Results
Richard M. Gutierrez, Andrew Herschfelt, Hanguang Yu, Daniel Bliss, Hyunseok Lee, Arizona State University, United States

TA8b3-3 Frequency Invariance Beamforming for Arbitrary Planar Arrays
Alessio Medda, Georgia Tech Research Institute, United States; Arjun Patel, Georgia Institute of Technology, United States

TA8b3-4 Time-Decentralized DOA Estimation for Electronic Surveillance
Songsri Sirianunpiboon, Stephen D. Howard, Stephen D. Elton, Defence Science & Technology Group, Australia

TA8b3-5 One-Bit Digital Radar
Jiaying Ren, Jian Li, University of Science and Technology of China, China

TA8b3-6 Analysis of Sparse Co-Prime Sensing Array Performance Using Wideband Noise Signals
David Alexander, Ram Narayanan, The Pennsylvania State University, United States; Braham Himed, US Air Force Research Laboratory, United States

TA8b3-7 Joint Transmit-Receive Beamspace Design for Colocated MIMO Radar in the Presence of Deliberate Jammers
Jiawei Liu, Saquib Mohammad, University of Texas at Dallas, United States

TA8b3-8 Radar Detection in K-Distributed Clutter using Multiple Order-Statistics combining
James Ritcey, University of Washington, United States

Session TA8b4 Source Localization

Chair: *Benjamin Friedlander, University of California, Santa Cruz*

10:15 AM–11:55 AM

TA8b4-1 Distributed Beamforming with High Altitude Balloon Relays
Ameya Agaskar, Keith Forsythe, Navid Yazdani, MIT Lincoln Laboratory, United States

TA8b4-2 On the Accuracy of Array Manifold Models
Benjamin Friedlander, University of California, Santa Cruz, United States

TA8b4-3 The Role of Difference Coarrays in Correlation Subspaces
Chun-Lin Liu, P. P. Vaidyanathan, California Institute of Technology, United States

TA8b4-4 A Newton-type Forward Backward Greedy Method for Multi-Snapshot Compressed Sensing
Ahmad Bazzi, RivieraWaves-CEVA and EURECOM, France; Dirk Slock, Lisa Meilhac, EURECOM, France

TA8b4-5 DOA Estimation with k-Times Extended Co-prime Arrays
Xiaomeng Wang, Xin Wang, Stony Brook University, United States

TA8b4-6 Cumulant-Based Direction-of-Arrival Estimation Using Multiple Co-Prime Frequencies
Ammar Ahmed, Yimin D. Zhang, Temple University, United States; Braham Himed, Air Force Research Laboratory, United States

TA8b4-7 Analog Beam Tracking in Linear Antenna Arrays: Convergence and Optimality
Jiahui Li, Tsinghua University, China; Yin Sun, The Ohio State University, United States; Limin Xiao, Shidong Zhou, Tsinghua University, China; C. Emre Koksal, The Ohio State University, United States

TA8b4-8 Array Calibration in the Presence of Linear Manifold Distortion
Benjamin Friedlander, University of California, Santa Cruz, United States

Session TP1a Fundamentals of mmWave Communications

Co-Chairs: *Aditya Dhananjay, NYU Tandon School of Engineering and David Ramirez, NYU Tandon School of Engineering*

TP1a-1 Rate-Optimal Power and Bandwidth Allocation in an Integrated RF-Millimeter Wave Communications System 1:30 PM
Morteza Hashemi, C. Emre Koksal, Ness B. Shroff, The Ohio State University, United States

TP1a-2 Managing Analog Beams in mmWave Networks 1:55 PM
Yasaman Ghasempour, Rice University, United States; Narayan Prasad, Mohammad Khojastepour, Sampath Rangarajan, NEC Labs, United States

TP1a-3 Energy Efficient Beam Alignment in Millimeter Wave Networks 2:20 PM
Muddassar Hussain, Nicolo Michelusi, Purdue University, United States

TP1a-4 5G Millimeter Wave Cellular System Capacity with Fully Digital Beamforming 2:45 PM
Sourjya Dutta, C. Nicolas Barati, Aditya Dhananjay, Sundeep Rangan, New York University, Tandon School of Engineering, United States

Session TP1b Hardware Designs for 5G Wireless Systems (Invited)

Chair: *Zhengya Zhang, University of Michigan*

TP1b-1 Adaptive and Multi-Mode Baseband Systems for Next Generation Wireless Communication 3:30 PM
Farhana Sheikh, Mehnaz Rahman, Dongmin Yoon, Alexios Balatsoukas-Stimming, Oskar Andersson, Deepak Dasalukunte, Ankit Sharma, Anthony Chun, Intel Corporation, United States

TP1b-2 VLSI Design of a Nonparametric Equalizer for Massive MU-MIMO 3:55 PM
Gulnar Mirza, Ramina Ghods, Charles Jeon, Arian Maleki, Christoph Studer, Cornell University, United States

TP1b-3 An Area-Efficient Parallel Memory for Massive MIMO using Channel State Information Compression 4:20 PM
Yangxurui Liu, Ove Edfors, Liang Liu, Viktor Öwall, Lund University, Sweden

TP1b-4 Segmented Successive Cancellation List Polar Decoding with Joint BCH-CRC Codes 4:45 PM
Xiao Liang, Huayi Zhou, Southeast University, China; Zhongfeng Wang, Nanjing University, China; Xiaohu You, Chuan Zhang, Southeast University, China

Session TP2a Noncoherent Wireless Communications (Invited)

Co-Chairs: *Dirk Slock, EURECOM, France and Maxime Guillaud, Huawei Technologies Co. Ltd, France*

TP2a-1 Large Antenna Arrays for Direction Finding using Phaseless Non-Coherent Measurements 1:30 PM
Mainak Chowdhury, Milind Rao, Andrea Goldsmith, Stanford University, United States

TP2a-2 Design and Analysis of a Practical Codebook for Non-Coherent Communications 1:55 PM
Khac-Hoang Ngo, Alexis Decurninge, Maxime Guillaud, Huawei Technologies France SASU, France; Sheng Yang, LSS, CentraleSupelec, France

TP2a-3 Hierarchical Coherent and Noncoherent Communication 2:20 PM
Ramy Gohary, Carleton University, Canada; Kareem Attiah, University of Alexandia, Egypt; Karim Seddik, American University in Cairo, Egypt

TP2a-4 Noncoherent Multi-User MIMO Communications using Covariance CSIT 2:45 PM
Christo Kurisummoottil Thomas, Wassim Tabikh, Dirk Slock, EURECOM, France; Yi Yuan-Wu, Orange Labs, France

Session TP2b Massive MIMO Systems

Chair: *Elza Erkip, NYU Tandon School of Engineering, USA*

TP2b-1 Cell-Free Massive MIMO Systems Utilizing Multi-Antenna Access Points 3:30 PM
Ahmad Ibrahim, Purdue University, United States; Alexei Ashikhmin, Thomas Marzetta, Bell Labs, United States; David Love, Purdue University, United States

TP2b-2 Greed is Good: Leveraging Submodularity for Antenna Selection in Massive MIMO 3:55 PM
Aritra Konar, Nicholas D. Sidiropoulos, University of Minnesota-Twin Cities, United States

TP2b-3 Massive MIMO Functionality Splits based on Hybrid Analog-Digital Precoding in a C-RAN Architecture 4:20 PM
Dong Min Kim, Jihong Park, Elisabeth De Carvalho, Carles Navarro Manchón, Aalborg University, Denmark

TP2b-4 On the Hardware Efficiency of Decentralized Equalization in Massive MU-MIMO Systems 4:45 PM
Kaipeng Li, Rice University, United States; Charles Jeon, Cornell University, United States; Joseph Cavallaro, Rice University, United States; Christoph Studer, Cornell University, United States

Session TP3a Medical Image Acquisition and Reconstruction (Invited)

Chair: *Daniel S. Weller, University of Virginia*

TP3a-1 Reconstructing High-Resolution Cardiac MR Movies from Low-Resolution Frames 1:30 PM
Liam Cattell, Craig H. Meyer, Frederick H. Epstein, Gustavo K. Rohde, University of Virginia, United States

TP3a-2 Whole Brain Reconstruction from Multilayered Sections of a Mouse Model of Status Epilepticus 1:55 PM
Haoyi Liang, Natalia Dabrowska, Jaideep Kapur, Daniel Weller, University of Virginia, United States

TP3a-3 Improved Efficiency for Microstructure Imaging using High-Dimensional MR Correlation Spectroscopic Imaging 2:20 PM
Daeun Kim, Justin Haldar, University of Southern California, United States

TP3a-4 Multi-Dimensional Flow MRI for Single Sequence Pediatric Exams 2:45 PM
Joseph Cheng, Marcus T. Alley, Stanford University, United States; Michael Lustig, University of California, Berkeley, United States; John M. Pauly, Shreyas S. Vasanawala, Stanford University, United States

Session TP3b Networks of the Brain (Invited)

Chair: *Georgios Giannakis, University of Minnesota*

TP3b-1 Graph Slepians to Probe Into Large-Scale Network Organization of Resting-State Functional Connectivity — 3:30 PM
Maria Giulia Preti, Dimitri Van De Ville, Ecole Polytechnique Fédérale de Lausanne and University of Geneva, Switzerland

TP3b-2 Robust Tensor Decomposition of Resting Brain Networks in Stereotactic EEG — 3:55 PM
Jian Li, University of Southern California, United States; John Mosher, Dileep Nair, Jorge Gonzalez-Martinez, Cleveland Clinic, United States; Richard Leahy, University of Southern California, United States

TP3b-3 Multiscale network analysis through tail-greedy bottom-up approximation, with applications in neuroscience — 4:20 PM
Piotr Fryzlewicz, London School of Economics, United Kingdom; Xinyu Kang, Boston University, United States; Catherine Chu, Massachusetts General Hospital, United States; Mark Kramer, Eric D. Kolaczyk, Boston University, United States

TP3b-4 Multi-kernel Change Detection for Dynamic Functional Connectivity Graphs — 4:45 PM
Georgios Vasileios Karanikolas, University of Minnesota, United States; Olaf Sporns, Indiana University, United States; Georgios B. Giannakis, University of Minnesota, United States

Session TP4a Crowdsourcing (Invited)

Co-Chairs: *Lav Varshney, University of Illinois Urbana-Champaign and Mark Hasegawa-Johnson, University of Illinois Urbana-Champaign*

TP4a-1 Permutation-based Models for Crowdsourcing: Optimal Estimation and Robustness — 1:30 PM
Nihar Shah, University of California, Berkeley, United States; Sivaraman Balakrishnan, Carnegie Mellon University, United States; Martin Wainwright, University of California, Berkeley, United States

TP4a-2 Incentive Design in Crowdsourcing with Strategic Agents — 1:55 PM
Donya Ghavidel Dobhakhshari, Kewei Chen, University of Notre Dame, United States; Lav Varshney, University of Illinois at Urbana-Champaign, United States; Yih-Fang Huang, Vijay Gupta, University of Notre Dame, United States

TP4a-3 Mismatched Crowdsourcing: Mining Latent Skills to Acquire Speech Transcriptions 2:20 PM
Mark Hasegawa-Johnson, University of Illinois at Urbana-Champaign, United States; Preethi Jyothi, Indian Institute of Technology Bombay, United States; Wenda Chen, University of Illinois at Urbana-Champaign, United States; Van Hai-Do, Advanced Digital Sciences Center, Singapore

TP4a-4 Crowdsourced Clustering via Triangle Queries 2:45 PM
Ramya Korlakai Vinayak, Babak Hassibi, California Institute of Technology, United States

Session TP4b Adaptive Signal Processing I

Chair: *Peter Tuuk, Georgia Institute of Technology*

TP4b-1 Using Random Matrix Theory to Improve Radar Space-Time Adaptive Processing 3:30 PM
Peter Tuuk, James McClellan, Georgia Institute of Technology, United States

TP4b-2 Reliable Conjugate Gradient Method with applications in Adaptive Filtering and Machine Learning 3:55 PM
Chandrasekhar Radhakrishnan, Andrew Singer, University of Illinois at Urbana-Champaign, United States

TP4b-3 Invariance and the Bayesian Approach to Generalized Coherence Tests 4:20 PM
Stephen D. Howard, Songsri Sirianunpiboon, Defence Science & Technology Group, Australia; Douglas Cochran, Arizona State University, United States

TP4b-4 Hilbert Space Geometry of Quadratic Covariance Bounds 4:45 PM
Stephen Howard, Defense Science and Technology Group, Australia; William Moran, Royal Melbourne Institute of Technology, Australia; Pooria Pakrooh, Louis Scharf, Colorado State University, United States

Session TP5a Array Processing for Spectrum Sharing (Invited)

Chair: *Yimin D. Zhang, Temple University*

TP5a-1 Spectrum Sharing Between Radar and Communication systems: Can The Privacy Of the Radar Be Preserved? 1:30 PM
Bo Li, Shunqiao Sun, Rutgers, The State University of New Jersey, United States; Matthew Clark, Konstantinos Psounis, University of Southern California, United States; Athina Petropulu, Rutgers, The State University of New Jersey, United States

TP5a-2 Interference Alignment based Precoder-Decoder Design for Radar-Communication Co-Existence 1:55 PM
Yuanhao Cui, Aalto University and Beijing University of Posts and Telecommunications, Finland; Visa Koivunen, Aalto University, Finland; Xiaojun Jing, Beijing University of Posts and Telecommunications, China

TP5a-3 Multiple-Antenna Multiple-Access Joint Radar and Communications Systems Performance Bounds 2:20 PM
Yu Rong, Alex Chririyath, Daniel Bliss, Arizona State University, United States

TP5a-4 Robust Astronomical Imaging under Coexistence with Wireless Communications 2:45 PM
Shuimei Zhang, Yujie Gu, Ben Wang, Yimin D. Zhang, Temple University, United States

Session TP5b Sparsity and Structure in Human Bio-Imaging (Invited)

Chair: *Bhaskar D. Rao, University of California, San Diego*

TP5b-1 Using Spatial Sparsity in Electrophysiological Source Localization 3:30 PM
Zeynep Akalin Acar, Scott Makeig, University of California, San Diego, United States

TP5b-2 MEG Spatio-temporal L1 Minimum-norm Source Images as Potential Biomarkers for Mild Traumatic Brain Injury and Post-traumatic Stress Disorder 3:55 PM
Mingxiong Huang, Ashley Robb-Swan, Annemarie Angeles-Quinto, Sharon Nichols, Dewleen Baker, Deborah Harrington, Charles Huang, Roland Lee, University of California, San Diego, United States

TP5b-3 Sampling theorems for Three Dimensional Zero Time of Echo (ZTE) Magnetic Resonance Imaging 4:20 PM
Ali Koochakzadeh, Piya Pal, Eric Ahrens, University of California, San Diego, United States

TP5b-4 SPECT Image Reconstruction under Imaging Time Constraints 4:45 PM
Igor Fedorov, Sebastian Obrzut, Bongyong Song, Bhaskar Rao, University of California, San Diego, United States

Session TP6a Biomedical Signal Processing and Information Extraction (Invited)

Chair: *Antonia Papandreou-Suppappola, Arizona State University*

TP6a-1 Brain Language: Uncovering Functional Connectivity Codes 1:30 PM
Victor Vergara, Vince Calhoun, The Mind Research Network, United States

TP6a-2 Predicting Postoperative Delirium in Patients Undergoing Deep Hypothermia Circulatory Arrest 1:55 PM
Owen Ma, Arindam Dutta, Arizona State University, United States; Amy Crepeau, Mayo Clinic, United States; Daniel Bliss, Arizona State University, United States

TP6a-3 Understanding Fetal Heart Rate Series by Hidden Markov Models and Nonparametric Bayesian Theory 2:20 PM
Kezi Yu, J. Gerald Quirk, Petar Djuric, Stony Brook University, United States

TP6a-4 Multiple Interface Brain and Head Models for EEG: A Surface Charge Approach 2:45 PM
Francisco J. Solis, Antonia Papandreou-Suppappola, Arizona State University, United States

Session TP6b Asynchronous and Neural Computing (Invited)

Chair: *Rajit Manohar, Yale University*

TP6b-1 How to Think About Asynchronous Computing 3:30 PM
Marly Roncken, Ivan Sutherland, Portland State University, United States

TP6b-2 The Benefits and Pitfalls of Asynchrony in Computer Systems 3:55 PM
Rajit Manohar, Yale University, United States

TP6b-3 Digital Signal Processing in the Continuous-Time Domain Using Asynchronous Techniques 4:20 PM
Yu Chen, Yannis Tsividis, Columbia University, United States

TP6b-4 Neuromorphic Event-Driven Multi-Scale Synaptic Connectivity and Plasticity 4:45 PM
Gert Cauwenberghs, University of California, San Diego, United States

TP6b-5 Efficient Online Learning with Low-Precision Synaptic Variables 5:10 PM
Marcus K. Benna, Stefano Fusi, Columbia University, United States

Session TP7a Computer Architecture

Chair: *Christoph Studer, Cornell University*

TP7a-1 Performance Comparison of AES-GCM-SIV and AES-GCM Algorithms for Authenticated Encryption on FPGA Platforms 1:30 PM
Sandhya Koteshwara, University of Minnesota, United States; Amitabh Das, Intel Corporation, United States; Keshab K. Parhi, University of Minnesota, United States

TP7a-2 An Efficient Reconfigurable Hardware Accelerator for Convolutional Neural Networks 1:55 PM
Anaam Ansari, Kiran Gunnam, Tokunbo Ogunfunmi, Santa Clara University, United States

TP7a-3 A Low-Power Digital ASIC for Detecting Heart-rate and Missing Beat 2:20 PM
Sepideh Nouri, Behnaam Aazhang, Rice University, United States; Mehdi Razavi, Texas Heart Institute, United States; Joseph Cavallaro, Rice University, United States

TP7a-4 An Effective Hardware Implementation of 1024-point Convolution Based on the Fast Hirschman Transform 2:45 PM
Linda S. DeBrunner, Dingli Xue, Florida State University, United States

Session TP7b Optimization Methods for Image Processing (Invited)

Chair: *Thomas Goldstein, University of Maryland*

TP7b-1 Approximate Semidefinite Programming Methods for Image Reconstruction and Segmentation. 3:30 PM
Tom Goldstein, University of Maryland, United States; Christoph Studer, Cornell University, United States

TP7b-2 BranchHull: Convex Bilinear Inversion from the Entrywise Product of Signals with Known Signs 3:55 PM
Alireza Aghasi, IBM, United States; Ali Ahmed, Information Technology University, Pakistan; Paul Hand, Rice University, United States

TP7b-3 Computational Microscopy 4:20 PM
Laura Waller, University of California, Berkeley, United States

TP7b-4 Information, Invariance and Generalization in Deep Representation Learning 4:45 PM
Alessandro Achille, Stefano Soatto, University of California, Los Angeles, United States

TP7b-5 Efficient Convex Optimization for Low-Rank Matrix Recovery 5:10 PM
Michael Friedlander, University of British Columbia, Canada

Session TP8a1 Networks and Graphs

Chair: *Santiago Segarra, MIT, USA*

1:30 PM–3:10 PM

TP8a1-1 Distributed Convergence Verification for Gaussian Belief Propagation
Jian Du, Soummya Kar, Jose' M. F. Moura, Carnegie Mellon University, United States

TP8a1-2 Mobility and Decision-making on Graphs: Utility Maximization for Cabs
Augusto Santos, Soummya Kar, Ramayya Krishnan, Jose' M. F. Moura, Carnegie Mellon University, United States

TP8a1-3 Control of Networked Systems in the Graph-Frequency Domain
Juan Andres Bazerque, Pablo Monzon, Universidad de la Republica - Uruguay, Uruguay

TP8a1-4 Broadcast Caching Networks with Two Receivers and Multiple Correlated Sources
Parisa Hassanzadeh, New York University, Tandon School of Engineering, United States; Antonia Tulino, Bell Labs & Università di Napoli Federico II, United States; Jaime Llorca, Bell Labs, United States; Elza Erkip, NYU Tandon School of Engineneering, United States

TP8a1-5 Distributed Inference with Multiple Decision Makers
Wenwen Zhao, Lifeng Lai, University of California, Davis, United States

TP8a1-6 Self-Accelerating Consensus Filter Design for Stochastic Networks
Stephen Kruzick, Jose' M. F. Moura, Carnegie Mellon University, United States

TP8a1-8 Representation of Positive Alpha-Stable Network Traffic Through Levy Mixtures
Chad Bollmann, Murali Tummala, John McEachen, Naval Postgraduate School, United States

Session TP8a2 Biomedical Signal Processing

Chair: *Siamak K. Sorooshyari, Ellipsis Health*

1:30 PM–3:10 PM

TP8a2-1 Toward Depth Estimation using Mask-Based Lensless Camera
M. Salman Asif, University of California, Riverside, United States

TP8a2-2 Glaucoma Detection using Texture Features Extraction
Kavya N, Dr Padmaja K V, RV College of Engineering, India

TP8a2-5 ECG Segmentation Using Adaptive Hermite Functions
Péter Kovács, Eötvös L. University, Hungary; Carl Böck, Johannes Kepler University, Austria; Jens Meier, Kepler University Hospital, Austria; Mario Huemer, Johannes Kepler University, Austria

TP8a2-6 Optimal Finite-Horizon Sensor Selection for Boolean Kalman Filter
Mahdi Imani, Ulisses Braga-Neto, Texas A&M University, United States

TP8a2-7 Variational Principle for Ultracoustic Artifact Correction and Signal Segmentation
Jue Wang, Union College, United States; Yongjian Yu, University of Virginia, United States

TP8a2-8 Model-Based Decoding of Time-Varying Visual Information during Saccadic Eye Movements using Population-Level Information
Kaiser Niknam, Amir Akbarian, Behrad Noudoost, Neda Nategh, Montana State University, United States

Session TP8a3 Networks and Applications

Co-Chairs: *David Ramirez, Carlos III University of Madrid, Spain and Hao Zhu, University of Texas at Austin, USA*

1:30 PM–3:10 PM

TP8a3-1 Distributed Center and Coverage Region Estimation in Wireless Sensor Networks Using Diffusion Adaptation
Sai Zhang, Cihan Tepedelenlioglu, Andreas Spanias, Arizona State University, United States

TP8a3-2 Load Forecasting Based Distribution System Network Reconfiguration–A Distributed Data-Driven Approach
Yi Gu, University of Denver, United States; Huaiguang Jiang, National Renewable Energy Laboratory, United States; Jun Jason Zhang, University of Denver, United States; Yingchen Zhang, Eduard Muljadi, National Renewable Energy Laboratory, United States

TP8a3-3 Chance-Constrained Day-Ahead Hourly Scheduling in Distribution System Operation
Yi Gu, University of Denver, United States; Huaiguang Jiang, National Renewable Energy Laboratory, United States; Jun Jason Zhang, University of Denver, United States; Yingchen Zhang, Eduard Muljadi, National Renewable Energy Laboratory, United States

TP8a3-4 Modeling and Optimization of Complex Building Energy Systems with Deep Neural Networks
Yize Chen, Yuanyuan Shi, Baosen Zhang, University of Washington, United States

TP8a3-5 Optimal Measurement Policy for Predicting UAV Network Topology
Abolfazl Razi, Fatemeh Afghah, Northern Arizona University, United States; Jacob Chakareski, University of Alabama, United States

TP8a3-6 Sensor Selection and Power Allocation via Maximizing Bayesian Fisher Information for Distributed Vector Estimation
Mojtaba Shirazi, Alireza Sani, Azadeh Vosoughi, University of Central Florida, United States

TP8a3-7 Detecting Adversaries in Distributed Estimation
Yuan Chen, Soummya Kar, Jose' M. F. Moura, Carnegie Mellon University, United States

TP8a3-8 Authentication of Parties in Piggy Bank Cryptography
Prashanth Busireddygari, Subhash Kak, Oklahoma State University, United States

Session TP8a4 Networks for Communication Systems

Chair: *Nicolo Michelusi, Purdue University, USA*

1:30 PM–3:10 PM

TP8a4-1 A Distributed Admission Control Algorithm for Multicell MISO Downlink Systems
Shashika Manosha Kapuruhamy Badalge, Satya Joshi, Marian Codreanu, Nandana Rajatheva, Matti Latva-aho, University of Oulu, Center for Wireless Communications, Finland

TP8a4-2 Fractional Frequency Reuse Scheme for Interference Mitigation in Device-To-Device Communication Underlying LTE-A Networks
Devarani Ningombam, Jae-young Pyun, Suk-seung Hwang, Seokjoo Shin, Chosun University, Republic of Korea

TP8a4-3 Semi-distributed Conflict-free Multichannel TDMA Link Scheduling for 5G
Zahra Naghsh, Shahrokh Valaee, University of Toronto, Canada

TP8a4-4 Trajectory Optimization for Mobile Access Point
Rajeev Gangula, Paul de Kerret, Omid Esrafilian, David Gesbert, EURECOM, France

TP8a4-5 Identifying Coverage Holes: Where To Densify?
Rebal Jurdi, Jeffrey Andrews, University of Texas at Austin, United States; Dave Parsons, Crown Castle, United States; Robert Heath, University of Texas at Austin, United States

TP8a4-6 Optimal Power Control and Scheduling under Hard Deadline Constraints for Continuous Fading Channels
Ahmed Ewaisha, Cihan Tepedelenlioglu, Arizona State University, United States

TP8a4-7 The Role of Transmitter Cooperation in Linear Interference Networks with Block Erasures
Yasemin Karacora, Tolunay Seyfi, Aly El Gamal, Purdue University, United States

TP8a4-8 Exploring Spatial Motifs for Device-to-Device Network Analysis (DNA) in 5G Networks
Tengchan Zeng, Omid Semiari, Walid Saad, Virginia Tech, United States

Session TP8b1 Privacy, Secrecy and Channel Capacity

Chair: *Athina Petropulu, Rutgers University*

3:30 PM–5:35 PM

TP8b1-1 Detection and Mitigation of Pilot Spoofing Attack
Jitendra Tugnait, Auburn University, United States

TP8b1-2 Function Computation with Privacy Constraints
Wenwen Tu, Lifeng Lai, University of California, Davis, United States

TP8b1-3 Bayesian Time Series Matching and Privacy
Ke Li, Hossein Pishro-Nik, Dennis Goeckel, University of Massachusetts Amherst, United States

TP8b1-4 Full-Duplex Communications for Wireless Links with Asymmetric Capacity Requirements
Orion Afisiadis, École Polytechnique Fédérale de Lausanne, Switzerland; Andrew C. M. Austin, University of Auckland, New Zealand; Alexios Balatsoukas-Stimming, Andreas Burg, École Polytechnique Fédérale de Lausanne, Switzerland

TP8b1-5 MIMO Wiretap Channel with ISI Heterogeneity–Achieving Secure DoF with no CSI
Jean Mutangana, Deepak Kumar, Ravi Tandon, University of Arizona, United States

TP8b1-6 Covert Active Sensing of Linear Systems
Dennis Goeckel, University of Massachusetts, United States; Boulat Bash, Saikat Guha, Raytheon BBN Technologies, United States; Don Towsley, University of Massachusetts, United States

TP8b1-7 Covert Communications on Continuous-Time Channels in the Presence of Jamming
Tamara Sobers, University of Massachusetts Amherst, United States; Boulat Bash, Saikat Guha, Raytheon BBN Technologies, United States; Donald Towsley, Dennis Goeckel, University of Massachusetts Amherst, United States

TP8b1-8 On the Combined Effect of Directional Antennas and Imperfect Spectrum Sensing upon Ergodic Capacity of Cognitive Radio Systems
Hassan Yazdani, Azadeh Vosoughi, University of Central Florida, United States

Session TP8b2 Communication System Design and Resource Allocation

Chair: *Matthias Grosglauser, EPFL, Switzerland*

3:30 PM–5:35 PM

TP8b2-1 Underwater Acoustic Communications using Quasi-Orthogonal Chirps
Song-Wen Huang, George Sklivanitis, Dimitris A. Pados, Stella N. Batalama, State University of New York at Buffalo, United States

TP8b2-2 Pulse Design for Spectrally Efficient Transmissions Assuming Maximum Likelihood Detection
Baptiste Cavarec, Mats Bengtsson, Royal Institute of Technology, Sweden

TP8b2-3 Path-Based Channel Estimation for Acoustic OFDM Systems: Real Data Analysis
Amir Tadayon, Milica Stojanovic, Northeastern University, United States

TP8b2-4 On the Performance of Polar Codes for 5G eMBB Control Channel
Seyyed Ali Hashemi, Carlo Condo, Furkan Ercan, Warren Gross, McGill University, Canada

TP8b2-5 Multiple Transmitter Localization using Clustering by Likelihood of Transmitter Proximity
Marjan Saadati, Jill Nelson, George Mason University, United States

TP8b2-6 Kolkata Paise Restaurant Game for Resource Allocation in the Internet of Things
Taehyeun Park, Walid Saad, Virginia Tech, United States

TP8b2-7 Implementation Approaches for 512-tap 60 GSa/s Chromatic Dispersion FIR Filters
Anton Kovalev, Oscar Gustafsson, Mario Garrido, Linköping University, Sweden

TP8b2-8 Brain-Aware Wireless Networks: Learning and Resource Management
Ali Taleb Zadeh Kasgari, Walid Saad, Virginia Tech, United States; Merouane Debbah, CentraleSupelec, Universite Paris-Saclay, France

Session TP8b3 Coding Theory and Sequences

Chair: *Nicolò Michelusi, Purdue University*

3:30 PM–5:35 PM

TP8b3-1 Zero-Forcing Precoding Using Generalized Inverses for G.fast DSL Systems
Andreas Barthelme, Michael Joham, Technische Universität München, Germany; Rainer Strobel, Intel, Germany; Wolfgang Utschick, Technische Universität München, Germany

TP8b3-2 Coding Scheme for Reliable In-Memory Hamming Distance Computation
Zehui Chen, Clayton Schoeny, Lara Dolecek, University of California, Los Angeles, United States; Yuval Cassuto, Technion - Israel Institute of Technology, Israel

TP8b3-3 Polar Coding for the Large Hadron Collider: Challenges in Code Concatenation
Alexios Balatsoukas-Stimming, Tomasz Podzorny, Jan Uythoven, European Organization for Nuclear Research (CERN), Switzerland

TP8b3-4 A Block-Based Tomlinson-Harashima Precoder for Wireless Uplink
Ismail Mohamed, Vaughan Clarkson, University of Queensland, Australia

TP8b3-5 Joint Constellation and Code Design for the Gaussian Multiple Access Channel
Yu-Chung Liang, Stefano Rini, National Chiao Tung University, Taiwan; Joerg Kliewer, New Jersey Institute of Technology, United States

TP8b3-6 Pseudorandom Tableau Sequences
Prashanth Busireddygari, Subhash Kak, Oklahoma State University, United States

TP8b3-7 Effect of Inter-User Delay and Channel Phase Response on MC-CDMA using WBE Codes with Application to Lower VHF
Fikadu Dagefu, Army Research Laboratory, United States; Predrag Spasojevic, Oak Ridge Associated Universities / Rutgers University, United States; Gunjan Verma, Brian Sadler, Army Research Laboratory, United States

TP8b3-8 Unique Paraunitary-Based Complementary QAM Sequences
Predrag Spasojevic, Rutgers University, United States; Srdjan Budishin, RT-RK, Yugoslavia

Session TP8b4 Detection Methods and mmWave Systems

Chair: *Lee Swindlehurst, University of California, Irvine*

3:30 PM–5:35 PM

TP8b4-1 Detection of Almost-Cyclostationarity: An Approach Based on a Multiple Hypothesis Test
Stefanie Horstmann, Universität Paderborn, Germany; David Ramírez, Universidad Carlos III de Madrid, Spain; Peter J. Schreier, Universität Paderborn, Germany

TP8b4-2 Sparse Estimation for Wideband mmWave Channel with Hybrid Antenna Architecture
Ganesh Venkatraman, Alok Sethi, Antti Tölli, Aarno Pärssinen, Markku Juntti, University of Oulu, Center for Wireless Communications, Finland

TP8b4-3 Multi-scale Spectrum Sensing in Mm-Wave Cognitive Networks
Nicolo Michelusi, Purdue University, United States; Matthew Nokleby, Wayne State University, United States; Urbashi Mitra, University of Southern California, United States; Robert Calderbank, Duke University, United States

TP8b4-4 CA-CFAR Detection Based on AWG Interference Model in a Low-Complexity WCP-OFDM Receiver
Steven Mercier, Stéphanie Bidon, Damien Roque, Univ. Toulouse, France

TP8b4-5 Synchronization Signal Design and Hierarchical Detection for the D2D Sidelink
Konstantinos Manolakis, Wen Xu, Huawei Technologies, Germany; Giuseppe Caire, Technische Universität Berlin, Germany

TP8b4-6 60 GHz Blockage Study using Phased Arrays
Christopher Slezak, Aditya Dhananjay, Sundeep Rangan, New York University, United States

TP8b4-7 Two-Stage LASSO ADMM Signal Detection Algorithm For Large Scale MIMO
Anis Elgabli, Purdue University, United States; Ali Elghariani, University of Tripoli, Libyan Arab Jamahiriya; Abubakr Al-Abbasi, Mark Bell, Purdue University, United States

TP8b4-8 Radio Signal Identification using Deep Scattering Networks
Hao Chen, Seung-Jun Kim, University Maryland, Baltimore County, United States

Session WA1a Theory of Wireless Systems

Chair: *Rick Blum, Lehigh University*

WA1a-1 On Deep Learning-Based Communication Over the Air 8:15 AM
Sebastian Dörner, Sebastian Cammerer, University of Stuttgart, Germany; Jakob Hoydis, Nokia Bell Labs, France; Stephan ten Brink, University of Stuttgart, Germany

WA1a-2 Energy Optimization for Hybrid-ARQ and AMC 8:40 AM
Bentao Zhang, Pamela Cosman, Larry Milstein, University of California, San Diego, United States

WA1a-3 Age Minimization in Energy Harvesting Communications: Energy-Controlled Delays 9:05 AM
Ahmed Arafa, Sennur Ulukus, University of Maryland, College Park, United States

WA1a-4 Correlated Interference with Interferer Memory 9:30 AM
Eric Ruzomberka, David J. Love, Purdue University, United States

Session WA1b Theory of Structured Waveforms

Chair: *Marco Lops, University of Cassino, Italy*

WA1b-1 HiHTP: A Custom-Tailored Hierarchical Sparse Detector for Massive MTC — 10:15 AM
Gerhard Wunder, Ingo Roth, Rick Fritschek, Jens Eisert, FU Berlin, Germany

WA1b-2 Lossless Natural Sampling for PWM Generation — 10:40 AM
Noyan Sevuktekin, Andrew Singer, University of Illinois at Urbana-Champaign, United States

WA1b-3 Dimension Spreading for Coherent Opportunistic Communications — 11:05 AM
Jordi Borras, Josep Font-Segura, Jaume Riba Sagarra, Gregori Vazquez, Technical University of Catalonia, Spain

Session WA2a MIMO Channel Estimation

Chair: *Lee Swindlehurst, University of California, Irvine*

WA2a-1 The Impact of Impedance Matching on Channel Estimation in Compact MIMO Receivers — 8:15 AM
Wuyuan Li, Brian Hughes, North Carolina State University, United States

WA2a-2 Affine Precoding-based Superimposed Training for Semi-Blind Channel Estimation in OSTBC MIMO-OFDM Systems — 8:40 AM
Himanshu B. Mishra, Indian Institute of Technology Kanpur, India; Naveen K. D. Venkategowda, Korea University, Republic of Korea; Aditya K. Jagannatham, Indian Institute of Technology Kanpur, India

WA2a-3 Joint Channel-Estimation/Decoding with Frequency-Selective Channels and Low-Precision ADCs — 9:05 AM
Peng Sun, Philip Schniter, The Ohio State University, United States; Robert Heath, University of Texas, United States; Zhongyong Wang, Zhengzhou University, China

WA2a-4 Sparse channel estimation using bad measurement matrices for FDD massive MIMO systems — 9:30 AM
Robert W. Heath Jr, University of Texas at Austin, United States; Nuria Gonzalez-Prelcic, Universidade de Vigo, Spain

Session WA2b Speech Processing

Chair: *Issa Panahi, University of Texas at Dallas*

WA2b-1 Real-World Evaluation of Multichannel Audio Enhancement Systems Using Acoustic Beacons — 10:15 AM
Ryan Corey, Andrew Singer, University of Illinois at Urbana-Champaign, United States

WA2b-2 Robust Real-time Sound Pressure Level Stabilizer for Multi-Channel Hearing Aids Compression for Dynamically Changing Acoustic Environment 10:40 AM
Yiya Hao, Ram Charan Chandra Shekar, Gautam Shreedhar Bhat, Issa M.S. Panahi, University of Texas at Dallas, United States

WA2b-3 Speech Enhancement Using Extreme Learning Machines 11:05 AM
Babafemi Odelowo, David Anderson, Georgia Institute of Technology, United States

Session WA3a Wireless Networks

Chair: *Tim Davidson, McMaster University, Canada*

WA3a-1 Analysis of Dense Cellular Networks with Stretched Exponential Path Loss 8:15 AM
Ahmad AlAmmouri, Jeffrey Andrews, Francois Baccelli, University of Texas at Austin, United States

WA3a-2 On the Sum Capacity of Many-to-one and One-to-many Gaussian Interference Channels. 8:40 AM
Abhiram Gnanasambandam, Ragini Chaluvadi, Srikrishna Bhashyam, IIT Madras, India

WA3a-3 Energy-optimal Computational Offloading for Simplified Multiple Access Schemes 9:05 AM
Mahsa Salmani, Timothy Davidson, McMaster University, Canada

WA3a-4 Echo State Transfer Learning for Data Correlation Aware Resource Allocation in Wireless Virtual Reality 9:30 AM
Mingzhe Chen, Beijing University of Posts and Telecommunications, France; Walid Saad, Virginia Tech, United States; Changchuan Yin, Beijing University of Posts and Telecommunications, China; Me´rouane Debbah, Huawei France R & D, France

Session WA3b Signal Processing over Graphs and Networks

Chair: *Antonio G. Marques, King Juan Carlos University, Spain*

WA3b-1 Time Estimation for Heat Diffusion on Graphs 10:15 AM
Oguzhan Teke, P. P. Vaidyanathan, California Institute of Technology, United States

WA3b-2 Partial Embedding Distance for Networks 10:40 AM
Weiyu Huang, Alejandro Ribeiro, University of Pennsylvania, United States

WA3b-3 A Graph Diffusion LMS Strategy for Adaptive Graph Signal Processing 11:05 AM
Roula Nassif, Cédric Richard, Université Nice Sophia Antipolis, France; Jie Chen, Northwestern Polytechnical University, China; Ali H. Sayed, University of California, United States

Session WA4a Computational Imaging (Invited)

Chair: *James Fowler, Mississippi State University*

WA4a-1 Physics-Driven Deep Training of Dictionary-Based Algorithms for MR Image Reconstruction 8:15 AM
Saiprasad Ravishankar, Il Yong Chun, Jeffrey A. Fessler, University of Michigan, United States

WA4a-2 Iterative Image Reconstruction for Neutron Laminography 8:40 AM
Singanallur Venkatakrishnan, Ercan Cakmak, Hassina Billheux, Philip Bingham, Richard Archibald, Oak Ridge National Laboratory, United States

WA4a-3 Computational Imaging with LORAKS: Reconstructing Linearly Predictable Signals using Low-Rank Matrix Regularization 9:05 AM
Justin Haldar, University of Southern California, United States

WA4a-4 Physics Based Modeling for the Development of Soft Segmentation and Reconstruction Algorithms 9:30 AM
Amirkoshyar Ziabari, Purdue University, United States; Jeffrey Rickman, Lehigh University, United States; Charles Bouman, Purdue University, United States; Jeff Simmons, Air Force Research Laboratory, United States

Session WA4b Deep Learning and Applications

Chair: *Karl Ni, In-Q-Tel*

WA4b-1 Interleaver Design for Deep Neural Networks 10:15 AM
Sourya Dey, Peter A. Beerel, Keith M. Chugg, University of Southern California, United States

WA4b-2 On Noise Reduction for Handwritten Writer Identification 10:40 AM
Karl Ni, Patrick Callier, Bradley Hatch, In-Q-Tel, United States

WA4b-3 Association of Emitter and Emission Using Deep Learning 11:05 AM
Trevor Landeen, Jake Gunther, Todd Moon, Utah State University, United States; David Ohm, Robert North, KickView, United States

Session WA5a Information Limits and Signals Representations (Invited)

Chair: *Massimo Franceschetti, University of California, San Diego*

WA5a-1 I-MMSE Relationships under Random Linear Mixing 8:15 AM
Galen Reeves, Duke University, United States

WA5a-2 Non-Smooth Convex Optimization and Structured Signal Recovery 8:40 AM
Ehsan Abbasi, Babak Hassibi, California Institute of Technology, United States

WA5a-3 Completely Blind Sensing for Robust Recovery of Multi-Band Signals 9:05 AM
Taehyung Lim, Massimo Franceschetti, University of California, San Diego, United States

WA5a-4 Off the grid Sparse Recovery in Bilinear Inverse Problems: Fundamental Limits and Algorithms 9:30 AM
Yanjun Li, Yoram Bresler, University of Illinois at Urbana-Champaign, United States

Session WA5b Array Signal Processing Algorithms

Chair: *Piya Pal, University of California, San Diego*

WA5b-1 MUSIC and Ramanujan: MUSIC-like Algorithms for Integer Periods Using Nested-Periodic-Subspaces 10:15 AM
Srikanth V. Tenneti, P. P. Vaidyanathan, California Institute of Technology, United States

WA5b-2 Underwater Acoustic Source Localization using Unimodal-constrained Matrix Factorization 10:40 AM
Junting Chen, Urbashi Mitra, University of Southern California, United States

WA5b-3 Leveraging Massive MIMO Spatial Degrees of Freedom to Reduce Random Access Delay 11:05 AM
Fatima Ahsan, Ashutosh Sabharwal, Rice University, United States

Session WA6a Signal Processing for Hearing Aids (Invited)

Chair: *Harinath Garudadri, University of California, San Diego*

WA6a-1 A Robust Adaptive Binaural Beamformer for Hearing Aids 8:15 AM
Jinjun Xiao, Tom Luo, Ivo Merks, Tao Zhang, Starkey Hearing Technologies, United States

WA6a-2 Noise Suppression and Speech Enhancement for Hearing Aid Applications using Smartphones 8:40 AM
Issa M.S. Panahi, Chandan K. A. Reddy, Linda Thibodeau, University of Texas at Dallas, United States

WA6a-3 Improving Auditory Externalization for Hearing-Aid Remote Microphones 9:05 AM
James Kates, Kathryn Arehart, University of Colorado, Boulder, United States

WA6a-4 A Realtime, Open Speech Platform for Research in Hearing Loss Compensation 9:30 AM
Harinath Garudadri, University of California, San Diego, United States; Arthur Boothroyd, San Diego State University, United States; Chinghua Lee, Swaroop Gadiyaram, Justyn Bell, Dhiman Sengupta, Sean Hamilton, Krishna Chaitanya Vastare, Rajesh Gupta, Bhaskar Rao, University of California, San Diego, United States

Session WA6b Neural Signal Processing

Chair: *Behnaam Aazhang, Rice University*

WA6b-1 Data-Driven Estimation of Mutual Information using Frequency Domain and its Application to Epilepsy — 10:15 AM
Rakesh Malladi, LinkedIn and Rice University, United States; Don Johnson, Rice University, United States; Giridhar Kalamangalam, Nitin Tandon, University of Texas Health Science Center, United States; Behnaam Aazhang, Rice University, United States

WA6b-2 An Autoregressive Approach to Inference in Populations of Correlated Stochastic Neurons — 10:40 AM
Alireza Sheikhattar, University of Maryland, College Park, United States; Siamak Sorooshyari, Ellipsis Health, United States; Behtash Babadi, University of Maryland, College Park, United States

WA6b-3 Multiplicative Updates for Optimization Problems with Dynamics — 11:05 AM
Abbas Kazemipour, Behtash Babadi, Min Wu, University of Maryland, United States; Kaspar Podgorski, Shaul Druckmann, Janelia Research Campus, United States

Session WA7a Hardware Design for Machine Learning (Invited)

Co-Chairs: *David Brooks, Harvard University and Paul Whatmough, Harvard University*

WA7a-1 Minimizing Area and Power of Deep Learning Hardware Design Using Binarization and Structured Compression — 8:15 AM
Shihui Yin, Deepak Kadetotad, Gaurav Srivastava, Minkyu Kim, Ming Tu, Chaitali Chakrabarti, Visar Berisha, Jae-sun Seo, Arizona State University, United States

WA7a-2 Sub-uJ Deep Neural Networks for Embedded Applications — 8:40 AM
Paul Whatmough, Sae Kyu Lee, Gu-Yeon Wei, David Brooks, Harvard University, United States

WA7a-3 How to Estimate the Energy Consumption of Deep Neural Networks — 9:05 AM
Tien-Ju Yang, Yu-Hsin Chen, Massachusetts Institute of Technology, United States; Joel Emer, Massachusetts Institute of Technology/Nvidia, United States; Vivienne Sze, Massachusetts Institute of Technology, United States

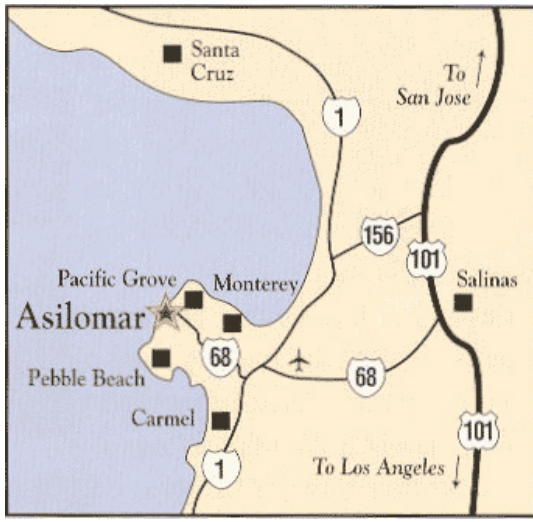
WA7a-4 Hardware-Algorithm-Application Co-Design for Efficient Embedded Deep Inference — 9:30 AM
Bert Moons, Marian Verhelst, KU Leuven, Belgium

Session WA7b Video Processing

Co-Chairs: *Ioannis Schizas, University of Texas at Arlington and Guohua Ren, University of Texas at Arlington*

WA7b-1	Multi-Object Detection and Tracking via Kernel Covariance Factorization in Thermal Video *Guohua Ren, Ioannis Schizas, University of Texas at Arlington, United States*	10:15 AM
WA7b-2	Interactive Image and Video Classification using Compressively Sensed Images *Jaclynn Stubbs, Marios Pattichis, Gabriel Birch, University of New Mexico, United States*	10:40 AM
WA7b-3	Motion-Aware Video Quality Assessment *Marina Georgia Arvanitidou, Thomas Sikora, Technische Universität Berlin, Germany*	11:05 AM

Author List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